DOCUMENT RESUME

ED 146 340 CE 011 523

AUTHOR	Postle, Walter; Heckman, Bradford
TITLE	An Investigation into the Computerized Data Bases of the Employment & Training Administration. Report on Second-Year Activities 1975-1976.
INSTITUTION	California Univ., Berkeley. Lawrence Berkeley Lab.
SPONS AGENCY	Employment and Training Administration (DOL), Washington, D.C.; Energy Research and Development Administration, Washington, D.C.
PUB DATE	Jan 77
NOTE	212p.; Best copy available
AVAILABLE FROM	National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (Printed copy $6.72; Microfiche $3.00)
EDRS PRICE	MF-$0.83 HC-$11.37 Plus Postage.
DESCRIPTORS	Computer Storage Devices; Data Analysis; *Data Bases; Data Processing; *Electronic Data Processing; Guides; Information Processing; *Information Retrieval; Information Utilization; *Management Information Systems
IDENTIFIERS	Department of Labor; Employment and Training Administration; United States

ABSTRACT

This report reviews activities of a research project which developed tools for bridging the gap between computerized data bases (of the Department of Labor's Employment and Training Administration) and data users who have no technical backgrounds. The development of RMIS (Regional Management Information System) is documented and serves to enable executives and staff officers as well as analysts to maximize the usefulness of information available through computers. A number of means (tools) are described to explain how several data systems are made available to users and how users may interact with those systems on human terms. (Working directly with the computer, users may retrieve information after browsing through viewing lists, analyze data by requesting charts or maps, and prepare reports by summarizing lists of relevant data. Additional tools facilitate the integration of data from different computer data bases.) Recommendations are presented that continued effort be expended to further develop computer-based tools which permit rapid and timely access and analysis of data. A 134-page appendix includes technical documentation of the computer tools, guide for their use, and sample reports via the interactive tools. (NB)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED146340

BEST COPY AVAILABLE

An Investigation Into the Computerized Data Bases of the Employment & Training Administration

Regional Management Information System Project (RMIS)

Report on Second-Year Activities

1975-1976

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Region IX
Employment & Training Administration

Walter Postle

Lawrence Berkeley Laboratory

Bradford Heckman

January 1977

U.S. Department of Labor
ETA, Region IX
San Francisco, California 94102

Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720

CE 011 523

LEGAL NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

Printed in the United States of America
Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
Price: Printed Copy $6.72; Microfiche $3.00

TABLE OF CONTENTS

1. Summary 1

2. Introduction 11

3. Research and Development Activities 18
   3.1 Relationship to SEEDIS 18
   3.2 Interactive Retrieval 20
   3.3 Interactive Analysis 23
   3.4 Interactive Report Formation and Listing 25
   3.5 Data Integration 27
   3.6 Field Development 28
   3.7 Table Independent Cell Structure 29

4. Conclusions and Suggestions for the Future 30

APPENDICES

APPENDIX A ESARS Retrieval Technical Documentation

APPENDIX B Guide to ESARS Retrieval

APPENDIX C CHART Users' Guide

APPENDIX D Sample Reports (Via the Interactive Tools)

APPENDIX E HUB (Data Integration) Writeup

APPENDIX F ESTICS Documentation

A C K N O W L E G E M E N T S

Project implementation is divided between Region IX Employment and Training Administration, which is responsible for identifying executive information requirements, and Lawrence Berkeley Laboratory (LBL), which is responsible for the computer science research and development. Those contributing to this project include

Employment and Training Administration
Region IX, San Francisco

Walter Postle, Chief
Management Data System Analysis

Bruce Bargmeyer

Kevin Thompson

Lawrence Berkeley Laboratory
Berkeley, California

Carl Quong, Department Head
Computer Science & Applied Mathematics

Donald Austin
Rosemary Allen
William Benson
Bruce Burkhart
Shirley Cassinelli
Tricia Coffeen
Wen-Sue Gee

Robert Healey
Bradford Heckman
Suzanne Kranz
Peter Kreps
Jim Miller
Virginia Sventek

This work was done with support from the
U.S. Energy Research and Development Administration.

Although it is probably better known for its many other functions, the Department of Labor's Employment and Training Administration (ETA) is one of the largest statistical agencies within the federal establishment. Through the operations of its components, such as the U. S. Employment Service (USES), Comprehensive Employment and Training Act (CETA) training programs, and the Unemployment Insurance Service (UIS), the ETA has created a very powerful data collection network. The ETA has not, however, created the necessary computer systems for the rapid retrieval, analysis, and display of information to meet the individual and non-routine needs of its operating staff or to meet the needs of the general public. The research and development project, discussed below, is aimed at initiating steps toward the solution of this deficiency.

The Regional Management Information System project (RMIS), was based on these premises -

- that the bulk of the resources expended by our nation for the use of electronic computers to aid in the "managing of information" has gone for the acquisition of computing machinery and the collection of raw data,
- that the application of advanced computer technology such as that which is available to the Energy Research and Development Administration's (ERDA) National Laboratories, for example, the Lawrence Berkeley Laboratory (LBL), could vastly improve the feasibility of turning raw data into usable information, and

- that research into current systems problems would lead to concepts for new and advanced information systems for use by both the ETA and the Department of Labor.

The project was, in a sense, concerned with taking up where the present implementation of the ETA computerized information systems left off. Specifically, the major objective of the project was to demonstrate that it was both feasible and practical to organize data that is currently available and to provide planning and management information in a much more usable and timely fashion than previously possible. The central focus of the project was to help managers and others maximize benefits from the ETA's large databases by developing tools which bridge the gap between the computer and the data user.

Stated another way, the project was concerned with looking at information needs from the point of view of the information user rather than that of the computer professional. How do users want the present forms of information altered? What entirely new forms of information are required? Recognizing that regardless of the tool involved, fast access to information is of critical concern, a secondary goal of the project was to develop tools which work interactively or in real-time as opposed to overnight or batch mode. Another general goal of the research was to make the tools as easy to use as possible, that is, to develop tools which require minimal training. In fact, the project has utilized interactive computing as a teaching resource. Utilizing systems developed through this project, ETA and state employment security agency staff with no background in computer technology may now enter

simple English language commands through a computer terminal and retrieve statistical data, format and produce reports, analyze data, and/or graphically display the results in a timely manner.

Data Installation

In October 1976 the United States Employment Service databases listed below were installed. These Employment Security Automated Reporting System (ESARS) databases consist of summary work history and socio-economic information on more than fifteen million people who use the public employment service each year. They are -

- the national and federal regional totals quarterly from September 1973 to June 1976,
- the nation-by-state for June 1974, June 1975, and quarterly for fiscal year 1976, and
- the Region IX states (Arizona, California, Hawaii, and Nevada) monthly from September 1973 to September 1976.

In addition to the above, a large number of other databases in SEEDIS were made available.

Interactive Retrieval

Given a source of raw data, it is reasonable to assume that people will want to browse through it, if for no other reason than to obtain subjective feelings for what is contained in the data. Going further, people will in all likelihood have occasion to want to know specific items of the raw data, either for themselves or

for others. These ideas all fall under the general idea of "retrieval".

The interactive retrieval system developed for ESARS data, Regional Management Information System (RGNLMIS), has the capability to scan through all the ESARS formats since September 1973, and to locate any subject area or characteristic included in the reports. It can provide extensive listings of either a general descriptive characteristic or a single specific detailed characteristic. Any ESARS report stored in the system can be retrieved in seconds, and the data can be printed by specifying an ESARS line number, if already known, or by specifying characteristics of interest found during a scan of the database. An entire ESARS table or a single data cell of a table can be retrieved. The ESARS report labels (headers and stubs) are always printed to identify the data item(s). The program has a highly developed user interface which prompts a user with requests for any information needed to carry out a command. Thus, users need to know very little about operating the computer program to begin retrieval of ESARS data. The program answers a variety of questions that may occur to users at the terminal and can also provide Dictionary of Occupational Title (DOT) code names when given a DOT code number or vice-versa. This latter development opens up for the first time extensive information, in considerable geographic detail, on the occupational characteristics of the unemployed. The use of this information adds considerably to the ability to analyze local labor markets.

Interactive Analysis

The next logical group of tools is concerned with analyzing specific items of raw data to begin to form more readily apparent information. Such tools include the ability to view patterns of data elements over a period of time and between different geographic areas. These tools permit the user to perform computations which clarify and project information.

The graphics program CHART was designed both to analyze and to display data through use of bar, pie, and line charts, etc. The CHART program allows users to interactively format a graph or report and to automatically set up a picture or report format. Users can then exercise a variety of commands to fashion the display to their own tastes. A variety of analytic computations can be performed (rank, median, etc.), and cosmetic improvements made to the display (shading, time rearrangement, column or row addition or deletion, etc.). After users have interactively designed their charts or tables, the finished product can be stored for later use.

Interactive Report Formation and Listing

The tools described so far have been designed to allow people to answer questions like "What data are available?" and "What kind of information can be produced from them?" The third group of tools is involved with the "reporting" function, helping to answer the question--"How can information be presented quickly, clearly, and in publishable form?" The computer based reporting systems of the

ETA have predominantly produced generalized tabular arrays, usually numerous pages of numbers designed to satisfy the information needs of many different requesters at many different levels. Even if individuals were able to isolate the items which were meaningful to them, the data are often not received in time to produce the desired impact. The computer tools investigated in this area allow specialized reports to be quickly produced, in various graphic as well as tabular forms. Tools have been developed which require so little computer training to use that it is reasonable for report designers to use computer resources directly without close interaction with a computer programmer.

Data Integration

Once results were achieved in interactive retrieval, analysis, report formation, and listing, the logical progression of project activities led in the direction of data integration. Substantial effort has been devoted to design considerations. A prototype system, HUB, is being implemented which allows both fast startup of any SEEDIS interactive tool and prompt transfer from one tool to another, i.e. from RGNLMIS to REAP (a data REtrievAl Program).

Field Development

As tools became available for user experimentation in the ETA, a program of field development was initiated to assist users. Seminars, demonstrations, workbooks, videotapes, and monthly status reports were the mechanisms developed to communicate with users. In addition, an LBL staff member was available to respond to

questions and concerns. Since user feedback in the design of a management information system is an essential input to research and development, communication with users at all levels of the ETA was emphasized.

Table Independent Cell Structure (TICS)

Recognizing the limitations imposed by the existing ESARS file structure, a modification to the original RMIS contract was implemented. Substantial efforts were expended designing a Table Independent Cell Structure for ESARS data. This is a logical extension of the original work, and will provide flexibility not available through the existing ESARS data structure.

Conclusions and Suggestions for the Future

The RMIS project has conclusively demonstrated that the information available from present ETA computer machinery and data structures can be significantly improved, both in terms of quality and of timeliness for use in the ETA management systems. More specific accomplishments and conclusions are -

- that prototypical interactive retrieval, analysis, and report formation tools have been developed which provide ETA users with the capability to exploit data files,
- that further research and development of interactive tools is required, particularly of interactive report formation and data integration mechanisms,

- that the computer tools demonstrated cannot be implemented in a nationwide production mode based on the existing system,
- that the Table Independent Cell Structure activity will provide the ETA with flexibility not available through the current ESARS data structure,
- that a much larger percentage of the ETA's administrative resources should be devoted to the task of providing usable information to the ETA management, in a timely manner, via modern computer technology, and,
- that a distributed computing network (DCN) should be created as an effective, efficient way to meet the reporting, planning, managing, and evaluation needs at all levels within ETA. This network would -
    - provide ETA with regional computer resources and expand ETA's national computer facilities,
    - permit a coherent division of labor and responsibility for database maintenance and use of computer facilities between the ETA national and regional offices,
    - provide a means for cost effective development of computer tools, systems, and applications,
    - meet the wide spectrum of regional planning and operational requirements on a regional basis instead of depending on a single national computer center,
    - allow for an effective means for local data acquisition

and editing for reporting requirements,

- provide access to large comprehensive databases stored at national facilities and the capability of integrating and retrieving tailored portions thereof,
- achieve economy of scale by providing access to large-scale computing systems for the execution of large and complex data analysis problems,
- establish an Administrative-Accounting-Financial Information System (AAFIS) (which will contain administrative, accounting, and financial information) as another centralized facility, and
- provide the mechanism and capability for the creation of regional data banks.

Network implementation should be coupled with efforts to -

- develop large database management systems,
- investigate analytical methods for updating, synthesizing and integrating relevant data, including statistical modeling techniques,
- develop data presentation techniques including graphic display systems and report generators, and
- investigate techniques for resource sharing over computer networks, including distributed data management techniques, database translation and reconfiguration

methods, and techniques for validating and integrating data from various sources, and

- develop a decision based management information system at regional and national levels.

Background

Since 1971, the ETA and LBL have worked on a wide range of large-scale research and development projects aimed at the extensive computerization of administrative and socio-economic-demographic data. All these projects had the same general objective, that of transforming raw data into information of direct utility to program managers. The initial work turned the 1970 Census of Population magnetic tapes into a system that today continues to produce planning and affirmative action data for ETA, its client agencies, and the general public.

The original ETA-LBL system, set up in response to high velocity Emergency Employment Act funding, consists of random access to census data for the entire nation down to the census tract level. It is unique in its use of advanced technology to make the computation of reports cheap and rapid. This system is now available through the U. S. Department of Commerce's National Technical Information Service (NTIS) for production of reports for areas of the users's own specification.

In addition to developing planning data for local agencies, ETA and LBL have designed and produced data for many different purposes--allocation of work and training funds to local program operators; detailed population distributions for the Family Assistance Program; labor force projections; revenue sharing and resource allocations for the State Employment Security Agencies (SESAs), etc. Computer runs have provided data furnished to employers for use in preparing Affirmative Action plans and to the

U. S. Department of Justice for use in enforcing them. The ETA-LBL projects have produced new results in the field of computer cartography. For example, in the development of statistical maps, LBL converted ordinary paper maps to computer files for all SMSA census tracts in the nation by utilizing a new laser technology. The joint Department of Labor-Department of Commerce publication series, Urban Atlas, was produced from this project. In sum, the ETA-LBL projects have provided specifically tailored reports for every significant town and ETA target area in the nation.

This success in cracking the large census data base led to further ETA projects to make occupation-industry projections to 1980 for all states and major SMSA's and to develop ways to improve the use of ETA administrative and economic data bases. Considering the gigantic scale of ETA's operations, this is no small task. With responsibility for the disbursement of between twenty and twenty-five billion dollars a year, ETA affects the lives of millions of Americans and all facets of the economy. For example, through the operations of the unemployment compensation insurance program, ETA has dealings with almost every private firm in the United States. Every major city and every moderately-sized community has an ETA funded State Employment Service (ES) office; and every state and most local governments receive ETA funds for job training and public service employment under the terms of the Comprehensive Employment and Training Act (CETA). These activities bring ETA into contact with millions of job seekers or unemployment insurance claimants. Also, much of the nation's economic intelligence is gathered through the ETA administrative and labor

market information network. Apart from the U. S. Post Office and perhaps the U. S. Social Security Administration, no other government agency matches E.A's ability to keep in touch with local economies across the continent.

Project Objectives

To carry out its multi-faceted operations, ETA requires information on a wide variety of topics--from broad-scale economic intelligence on the state of the national economy to detailed information on the costs of services on an Indian reservation. Owing to the nature of its mission, ETA must collect, store, reduce, and analyze a vast amount of data. The product of just one of its data files, ESARS, is about two and one-half billion characters per year. In three years, ESARS produces as much data as the data released from the 1970 Census of Population. The Unemployment Insurance data files are even larger - almost every firm and worker in the nation appear somewhere in the records.

Although ETA is one of the nation's leading statistical agencies and is heavily dependent on material from many different organizations, it has not created an effective information retrieval system or even necessary procedures to manage its information requirements. Its database is neither efficiently nor effectively structured and, generally speaking, has inadequate computer support. ETA's problem is thus not one of quantity or quality of data, but rather of access to data. Adding to ETA's information problem is the fact that the data files are scattered among several agencies - the Bureau of Labor Statistics (BLS), 54

SESAs (including Washington, D. C., Puerto Rico, Guam, and the Virgin Islands) as well as other federal departments such as the Department of Commerce and the Department of Health, Education, and Welfare.

The RMIS project seeks a solution to the problem of providing executives, staff officers, and analysts with the information they need, in the formats they find most useful, and at the time they want it. In a modern computer-based management information system, the user is king and should not have to put up with a routine report just because it is convenient for the computer system to produce it.

Developing the advanced statistical information system needed in ETA requires a conceptual understanding of -

- the information needs of the program managers and staff,
- the capabilities of computer technology, and
- ethics of the use of information (e.g. privacy issues).

In the development of this project, these conceptual areas have been brought together to produce results directly applicable to ETA operations. The direction of development has been determined by the observed gaps and problems in ETA's present national, regional, and local data systems. These include -

- inability to extract important information from existing databases without being frustrated by volumes of useless data,
- inability to change information requirements in response to

changing priorities,

- difficulty in getting rapid response in retrieving data held in machine-readable form,
- problems encountered in the design-programming phase of reports, such that a long lead-time is necessary or that reports come out in an arbitrary format that suits the computer but not the user,
- time, cost, and effort of preparing data for graphic display, where graphic (non-tabular) presentation can best show relationships in the data or the results of analysis, and
- difficulty in manipulating data for purposes of analysis. Even when only relevant data can be selected, the sheer volume of data required usually exceeds manual capacities and those of even the most powerful desk calculators.

To meet these deficiencies, the research effort concentrated on the following major areas -

- data management and retrieval--how to manage large data bases, such as ESARS, for interactive retrieval,
- raising the cognitive level--how to improve the quality and utility of output,
- human-machine relationships--how to raise the level of human-computer interface to assert human, rather than computer, control over the interaction, and

- development of statistical tools--to ensure efficient and effective analysis.

Project Administration

Responsibilities for the project's implementation were divided between staff of the Region IX ETA which was responsible for identifying information requirements, and LBL which was responsible for computer science. LBL, like other ERDA laboratories, is a leader in the development of computer techniques for data storage and retrieval, data analysis, and graphic display techniques. LBL also possesses centralized computing power far beyond the capacity of the Department of Labor and its associated government agencies.

Providing overall direction to the project was an Advisory Committee, chaired by the Region IX Economist, and composed of representatives from the national office of ETA and research specialists from the SESA's in Arizona, California, Hawaii, and Nevada. The membership of the Advisory Committee was as follows -

State Employment Security Agencies	Employment and Training Administration
Vincent Cullinane, Arizona	Robert Beasley
Ray Schulze, California	Joseph Epstein
Larry Clark, California	Kenneth Keith
Gordon Ing, Hawaii	Matthew Kessler
Jim Hanna, Nevada	Jack Long
	Russell Reber

The Advisory Committee provided advice and counsel on priorities

and proposed outputs, and made sure that the interests of the member's respective organizations were included in the work. The Committee's role was essential, since the evaluation of the project's usefulness must be determined by the users.

The Advisory Committee held meetings as follows-

July 31-August 1, 1974	August 27-28, 1975
October 28, 1974	February 4, 1976
January 22-23, 1975	June 16, 1976
April 2, 1975	October 27-28, 1976

The investigators received excellent cooperation from both the SESA and national ETA staff, particularly from the staff of the Office of Administration and Management's Division of ADP Systems, the Office of Field Operations, and the U. S. Employment Service's Office of Employment Administration. Not only have staff members of these organizations been active committee members, but they have also actively experimented with the system as it has developed and provided considerable technical support and wise counsel on information needs and related activities.

3.1 RELATIONSHIP TO SEEDIS

It is important to recognize that this project is part of the Socio-Economic-Environmental-Demographic Information System (SEEDIS) which has been under development at LBL for over four years. Comprised of many projects and supported by numerous federal organizations, SEEDIS activity focuses on the development of basic tools supportive of the ERDA programs as well as those of the sponsoring agencies. This coordination means that individual supporters reap the benefits of a more massive generalized effort. Databases installed via other SEEDIS projects (including a major portion of the 1970 Census of Population and Housing and various economic databases) are available to the RMIS project. Thus SEEDIS activity is a major integrated effort, oriented toward the solution of long term rather than short term problems.

The RMIS project was so named because of its joint sponsorship by ETA and LBL as a feasibility demonstration focusing on a single federal region. The installation of data and the development of the computer tools have, therefore, been oriented to the regional level as opposed to national or local concerns.

At the inception of the RMIS project, several ETA databases were considered for at least partial installation at LBL to support the research and development effort. These included the Plan of Service Automated Reporting System (POSARS), the Regional Automation System (RAS) and the Employment Security Automated Reporting System (ESARS). At the first Advisory Committee meeting, it was decided to concentrate on partial installation of the ESARS

summary level database at LBL. This decision was reached when it was learned that ETA was abandoning state support of the POSARS and that it was impossible, owing to major administrative difficulties, to mount the RAS. This latter system had far too many bugs in it for successful use.* The ESARS system was selected for installation because -

- it is a very expensive system which had not been developed to its full potential,
- the database is a rich resource which could be tapped to provide valuable information to ETA in a more timely manner,
- the data could be sent to LBL without interfering in any way with the existing reporting system, and
- the database presented all the typical problems that needed to be addressed in the research phase of the project.

---

* For an evaluation of RAS see - Regional Automation System, Summary Report, Computer Science and Applied Mathematics Department, Lawrence Berkeley Laboratory, University of California, Berkeley, California, 94720. September 15, 1976.

3.2 INTERACTIVE RETRIEVAL

A major goal and accomplishment of the RMIS project was to provide the capability to interactively retrieve data while requiring as little computer knowledge as possible. These ideas imply a less efficient use of computing resources, and therefore a more expensive computer system. However, the resultant system may prove to be cost effective in the long run as the costs of computing resources plummet while the costs of human talent continue to soar.

The general features of the interactive retrieval tool developed directly via the RMIS project are described in ESARS Retrieval Technical Documentation (Appendix A). There are two ideas about this tool which bear emphasis, however. First, it is dedicated to the concept of trading machine efficiency for human efficiency. More simply stated, this means that the human being controls the computer resources instead of the other way around. Second, the development of this tool has been and will continue to be the result of incorporating user feedback. Instead of attempting to design, implement, and release a "finished product", the approach has been to make user feedback one of the first capabilities of the tool, and then to develop further capabilities based on user comments and actual use patterns. This implies that development of the tool is molded more by the users of the tool than by its builders.

Details of the use and capabilities of the interactive retrieval tool developed specifically for the ESARS summary database may be

obtained from the Guide to Esars Retrieval (Appendix B). A general indication of the types of things users may do after connecting a terminal to the LBL computer center via normal phone lines, and after starting the retrieval tool, is provided in the following discussion.

Browsing is facilitated by viewing lists of the ESARS summary table names, stubs (line labels), and headers (column labels) available in the LBL database. The latter two lists are very long, and although they are interesting, it would be burdensome and time consuming to manually search through them, looking for entries applicable to a specific area of concern, such as veterans. Therefore, the tool has the capability of automatically scanning through any list selected by the user for any user-specified word, combination of words, or portions of words. One of the ESARS tables has Dictionary of Occupational Titles (DOT) codes instead of textual stubs. These tables, if listed on paper, would typically fill 15-20 pages. To aid users, a list associating DOT codes with their respective textual identifiers has been provided for viewing and/or scanning. Actual data retrieval requires the user to specify the year, month, and geographic area of interest.

A "specific data retrieval" capability allows the ESARS expert who happens to know the table or line numbers desired to ask to view particular tables and/or particular table lines. A "general data retrieval capability" is also provided which, in effect, allows one to ask to retrieve all the data items which correspond to a specified subject, regardless of location within the summary tables. The format and number of ESARS summary tables produced

varies over time and area. That is, a table produced one month may not be produced for the same area the next month because the table is only produced quarterly, or the table is no longer produced by the ESARS system, regardless of area. A line produced for one area may be unavailable for another area for that same year and month because the table was not produced for that particular area, or the data for that area, year, and month have not been installed at LBL. Should a user request data which is unavailable, the system informs the user why the data cannot be retrieved. It also provides the table names for items about to be displayed, thus giving users an opportunity to delete items which they obviously do not want to see. These features are designed to ease the frustration of "missing data" and to aid users in understanding the form and content of the database.

3.3 INTERACTIVE ANALYSIS

Computer tools to analyze data items after they are retrieved have also been investigated as part of the RMIS project. Two general areas of investigation may be identified - graphic displays and statistical computations.

The enormous information value of graphic representations is well established, but the use of such techniques has often been inhibited by high costs coupled with production delays. RMIS activity has been concerned with utilizing computer technology to develop graphic displays in a cost effective manner, so that users may develop displays and may obtain these displays in minutes at computer terminals located in their offices.

Two basic tools were developed in the area of graphics. The first, CHART, involves the formation of line graphs, bar charts, and pie charts. Although not originally developed under the RMIS project, this tool has received significant RMIS resources and reflects many of the design features of the ESARS retrieval tool. Details, including sample outputs, can be found in the Chart Users Guide (Appendix C). It should be noted that CHART, unlike the ESARS retrieval tool, was not designed for a specific database. Portions of this tool have been incorporated with interactive report formatting and listing tools, described in the next subchapter. The second tool, CARTE, involves the formation of maps. Although it has received little support from this project, the mapping tool is nearing the prototype stage where it will be interfaced to SEEDIS databases.

Finally, investigation has been initiated on providing interactive use of advanced statistical tools, such as the Statistical Package for the Social Sciences (SPSS). In establishing priorities for overall development of the project, the Advisory Committee emphasized the long run importance of statistical analysis but felt that other features should take precedence which would provide a logical bridge to such analysis; hence, no prototypes are yet available.

3.4 INTERACTIVE REPORT FORMATION AND LISTING

The term "report generation" has purposely not been used in this report because it seems to imply specific things to people when it is actually a general term, like "boating" or "building". There are apparently no generally accepted specific terms like "ranch house" or "hovercraft" which indicate the capabilities and limitations of so called "report generation" systems. Terms like report "design" and "production" have also not been used because they too are general, yet seem to imply (different) specific things to different people. Likewise, the term "report printing" (instead of listing) has not been used because it strongly implies paper when, increasingly, output in the form of a display on a TV-like screen is sufficient.

The objective of the "report formation" investigation is to develop a tool which report designers themselves may use with as little training as possible to ready their reports for "listing", thereby eliminating the inefficiences of interfacing with computer programmers. The prototype developed to date has been successfully used by Region IX staff members after a few hours of informal training, although it is still considered somewhat difficult to use and, therefore, must be improved and refined.

The objective of the "report listing" investigation is to develop a tool which will allow reports to be quickly and easily obtained (for any applicable areas and dates) after they are formed (through whatever process), again with as little training as possible. The prototype tool developed has also been successfully

used by Region IX staff, and they have in turn aided other noncomputer trained ETA personnel in its use. It too, however, is considered difficult to use in its present state and will be the subject of continuing investigation.

Examples of reports which have been "formed" and made available for listing via the present prototypes are contained in Sample Reports (via the Interactive Tools), Appendix D. The systems developed have been utilized to provide custom administrative and analytical reports on Employment Service target groups. These included reports on migrant and seasonal farmworkers, veterans, the Work Incentive Program, and Employment Service productivity. To illustrate, a large number of special tables were produced for the Special Review Committee overseeing implementation of the Judge Richie Court Order relating to services to seasonal farmworkers. These reports, produced at the national office for states in Region II, V, IX , and X, gave the USES staff ready access, for the first time, to the major ESARS database.

3.5 DATA INTEGRATION

As work on the basic tools has progressed, a portion of the RMIS project effort has been devoted to an investigation of tools which can be interfaced to multiple databases. For example, developing the report formatting tool described above to allow designers to request that data items from both the ESARS and 1970 Census of Population databases be placed on the same page of a report could result from such efforts.

Although design activity has been undertaken in this area, no prototype development has commenced. A prototype is currently being designed and implemented, however, which allows fast startup of any SEEDIS interactive tool and prompt transfers from one tool to any other (see HUB (Data Integration) Writeup, Appendix E). By allowing retrieval of multiple databases in a single human computer session, a start toward the goal of data integration has been made.

3.6 FIELD DEVELOPMENT

In order to provide assistance to SEEDIS users with the prototype tools as they become available, a program of field development has been initiated. The RMIS project has greatly supported these efforts and has reaped much of the benefit from them so far. Frequently, in implementing new systems, a "Catch-22" situation exists, in that in order to demonstrate the applicability of new tools to a real life or production atmosphere, such an atmosphere almost has to exist. Hence, it is difficult to maintain the appropriate distance between the research and the operational environment, particularly if the results of research may be intended for later operational implementation. The practical development of tools has, therefore, been supported when it is anticipated that the experience gained will be useful in further research and development efforts, never when the primary goal is to solve short-term operational problems.

Field development includes seminars, demonstrations, and the feedback we obtain from users of the tools. It also includes preparation of users' guides, workbooks, films, video tapes, and monthly status reports. Finally, and perhaps most importantly, it includes the availability of nonprogrammer LBL personnel to field questions about any SEEDIS tool. Friendly and reliable interface is the key to obtaining high quality feedback about overall progress.

3.7 TABLE INDEPENDENT CELL STRUCTURE

When the RMIS project was established, one of its basic premises was that the power of its tools could be demonstrated without interfering with ETA computer systems. A result of this premise was that the database accepted for demonstrative purposes (ESARS summary tables) was poorly structured for application of such tools. Therefore, much additional and costly restructuring had to be done at LBL, and the potential of the tools developed could only be partially realized. As the project progressed and the tools began to become visible, a contract modification was negotiated to enable an investigation of how ESARS could better be structured in the first place.

It should be emphasized that the term "ESARS Redesign" is inaccurate and ought not to imply negative connotations about the system. In fact, the ESARS designers did an excellent job, given the stated goals, available time, and financial constraints. Investigation of the development of a new design in support of new objectives is being undertaken, not development of a better design for the existing objectives.

As Appendix F ESTICS Documentation indicates, although no prototype is yet available for user experimentation, much of the experience gained from developing the present tools is being incorporated into the building blocks of the redesigned ESARS.

4. CONCLUSIONS AND SUGGESTIONS FOR THE FUTURE 30

The RMIS project was originally envisioned as a two-year effort with the installation of ESARS data, research on interactive computer mechanisms and the initial investigation of report formation systems occurring during the first year, and implementation of interactive systems and limited production of prototypical data reports during the second year. This schedule of work has been followed. The RMIS project has conclusively demonstrated that the information available from present ETA computer machinery and data structures can be significantly improved, both in terms of quality and of timeliness.

As with most endeavors, however, the work accomplished points to the need for continuing effort. The conclusions to be drawn from the RMIS experience provide a sense of direction which will be invaluable in future work.

First, the project has proved that tools can be developed which effectively bridge the gap between the data user and the computer. Prototype interactive retrieval, analysis, and report formation tools have been implemented which provide ETA users with the experimental and developmental capability to exploit ESARS data files. These computer based tools permit rapid and timely access and analysis of data.

The effort thus far strongly supports the need for further basic research and development of human-computer communication tools. The nonscientific and scientific press alike abound with descriptions of systems reputed to contain highly developed human computer interfaces. Finding those that are actually used for

attaining practical results, however, is very difficult indeed. Why is this so? Because to talk is cheap and to design is easy. Because in actuality the implementation of such interfaces is far from a trivial matter.

To date, most computer systems have been primarily designed by technically oriented people with little input from nontechnical users. In the 1950's, this phenomenon could be excused because most applications were technical and computing was very expensive. In the 1960's, the nonscientific community began to recognize the vast applications requiring number "pushing" as well as number "crunching," but hands-on access to computing power could still be justifiably denied due to economics alone. In the 1970's, the demand for computer systems which address the science of the use of the computational process as well as the science of the computational process itself has become overwhelming.

Yet computer systems continue to be designed by people primarily interested in the process of computing, even when the systems are database management systems or report generators which are reputedly user oriented. It is typical for the user interface to be given token interest during the design of such systems or to be constructed as an afterthought in an atmosphere devoid of input from eventual users. Thus the hands-on use of the state of the art computers remains a largely esoteric activity (compared to, say, hands-on use of automobiles). The RMIS project, however, has accepted the challenge and frustration of actually implementing its designs in an atmosphere which encourages feedback from eventual users as part of the design process. As described elsewhere,

continuing research in this area should focus on interactive report formation and data integration, both of which appear to be in very high demand by ETA personnel but are the most difficult to implement.

Second, it must be concluded that the computer tools demonstrated via this research effort cannot be implemented in a nationwide production mode based on the existing ESARS system. The ETA computer machinery is not capable of providing these tools to all Employment Security agencies. In addition, even if the raw computing capability were available and properly configured, implementation would not be reasonable because the present structure of the summary data is not adequate, without manipulation, for use with interactive tools. Not only would it be expensive to restructure the data monthly as LBL has done for demonstration purposes, but such a restructuring could not be done in the smooth, cyclical manner required in an operational environment. Moreover, even if it were, the restructured data does not allow such tools to be developed to their full potential.

The ESTICS activity indicates, however, that the detailed data can be summarized and structured in a way that allows not only the present tabular array type output but also other types of output generated interactively, such as those demonstrated via this project. The predominant concept behind such a structuring is the recognition that information needs are often dynamic and specialized. Therefore, the design of the data structure should allow input and output requirements to change over time. If the data is structured appropriately, no delays will be experienced.

Hence, in terms of data collection and structuring, the main emphasis should be placed on the structure of the summarized data because, if properly done, it will allow both changes to be made, with no delays, to the input and output requirements and the utilization of interactive tools.

Third, the limitations that available ETA computing power would place on implementing these prototype interactive tools on a nationwide basis suggest that efforts should be undertaken to establish a distributed network of ETA computers. With the rapidly growing trend for more data and more complex analysis, it is becoming evident that no one national center can meet the wide spectrum of planning, analytical, and reporting requirements of all the ETA regional offices. The demand by many users for immediate and fast access to computer tools and the concurrent need for manipulating many regional databases simultaneously could saturate even LBL's sizable computing capability. An effective and efficient way to meet the needs of planning, managing, and reporting at all ETA levels would be to establish a distributed computing system.*

---

* The following discussion is extracted from ETA Distributed Computer Network Project, UCID-3902, Computer Science and Applied Mathematics Department, Lawrence Berkeley Laboratory, University of California, 94720. December, 1976.

The Distributed Computer Network

A distributed computing system is based on the division of effort required to accomplish several levels of tasks performed by a large, diverse agency such as the ETA. The components include a centralized function for handling global (multiregional) tasks, regional functions for handling a multitude of local tasks, and a communications network providing access to all systems. These components are discussed below in some detail.

Centralized Functions

One of the major needs of ETA involves access to very large socio-economic-environmental-demographic (SEED) and administrative-accounting-financial-information system (AAFIS) databases, which are best handled by large-scale computer centers.

The effort and equipment required to provide efficient management of and access to large SEED databases such as the decennial census is minimized by using powerful computers and mass storage devices. Similarly, design and implementation of systems for regional management of programs is done best on a centralized basis. Because such databases are universally useful to planners, managers, and analysts, it is most cost effective to install them in centers of expertise where the processing power is available, providing access to this data directly, or by creating tailored subsets to be transmitted to a regional facility.

Another important function of a centralized facility is to have the presence of an expert staff of computer scientists,

statisticians, and analysts to develop and maintain operating systems and the basic utility programs. This staff also could be responsible for designing and implementing required standard programs for the special, large, or innovative application as well as for conducting the research and development to support these activities.

The economies of scale obtained in such large centers by consolidating large databases, the special analysis programs, and large-scale developmental efforts are also realized in providing access to costly peripheral equipment. A large center can provide special display facilities such as Computer Output to Microfilm (COM) devices ($250,000), color display equipment, dynamic graphics, and can spread the cost over hundreds of users. Another example is mass storage devices ($1,500,000) with the ability to store up to 200 billion bytes of data.

These centers could make all of their facilities - databases, analysis systems, special hardware - available on demand to regional and local users. Examples of such centers include LBL's SEEDIS program, the Environmental Protection Agency's Emissions Data System for air pollution data, and the National Oceanographic and Atmospheric Administration weather data center at the National Center for Atmospheric Research.

Regional Functions

The most frequent use of computer systems involves the daily routine of acquiring, editing, and preliminary analysis of regional data. These tasks require far less computing power than a large

centralized system can provide, and the continually decreasing costs of small computers and intelligent terminals makes local processing at remote sites economically practical. In fact, the capabilities of small computers today compare favorably with the power of large-scale systems a decade ago, and at less than one-twentieth of the cost. These small systems are capable of performing a large portion of the data preparation, program development, and summary report generation required for regional operation. They provide high level languages, data management systems, and communications packages to satisfy most of the needs of regional management. In addition, they are capable of expanding to meet the changing requirements of evolving programs. By specifying a uniform and compatible set of regional programs, the software development effort is reduced substantially by the policy of developing one system for many regions. The current estimate that software costs are four times the costs of hardware implies a tremendous savings in effort.

Regional systems also offer several major advantages over centralized systems for the class of problem for which they are applicable - increased reliability (when the central system is unavailable, all users must suffer); transportable software (a program developed by one region is usable by all); security and privacy of databases (difficult to handle in a central system); versatility (the system is readily available to specialized local applications).

An especially attractive feature is the cost - one large system can cost 40-50 times as much as a powerful small system. Even

then, the large system cannot handle a large number of users doing routine tasks. Although the large system is indispensible for handling large problems, the economy of scale may not apply for handling many small applications.

Networks

The mechanism for tying the separate components together to form a distributed computing system is the communications network. A communications network is more than just a bunch of wires or links in some arrangement connecting the various points of the system; it includes the protocols by which data can be transmitted and received. Low level protocols can be thought of as being an integral part of the communication process. These include such items as initiation of transmission, acknowledgement of receipt, synchronization codes, error detection, request for retransmission, route selection, and proper encoding and formatting of the data being sent. High level protocols are generally those rules by which the host computer or host process can interpret the data received and then take appropriate action as dictated by that data.

Although distributed computer networks are relatively new, other types of networks have been operating for about a decade. The most common (and successful) type of network in wide use is the star network, consisting of a single large-scale system accessed by remote users over remote job entry terminals (RJET) and/or interactive terminals. Examples of star networks are the DOL Regional System Facilities (Data 100 RJET's using IBM 2780 protocol) and the LBL COKE system (interactive terminals and

RJET's using Teletype, CDC 200 UT, Univac 1004, and COPE protocols).

Distributed networks, such as the ARPANET (initially developed for the Advanced Research Project Agency of the Department of Defense), provide important features not found in the above examples-

- connection of each node to every other node,
- multiple paths between any pair of nodes,
- in addition to Teletype and RJET protocols, host to host protocols provided for the transfer of files.

These features provide faster and more reliable communication and the capability to communicate for processes residing in different hosts. The latter implies that it could be possible to gather the resources (hardware, software, or data) from anywhere on the network and to make use of them as if they were resident on the local computer system.

Anticipated Work

To implement a distributed computer network for ETA as described above would call for research and development in distributed computing systems and in establishing large centralized data management and storage facilities at both the ETA regional office and LBL as part of that system. This would provide each ETA regional office with enough computing resources to meet most of its informational and analytical requirements on site, as well as

providing access to large databases, complex analytical programs, and special hardware located in centralized national centers. Each regional office would have access to any special resources located in any other region.

The Distributed Computing System

This system could be implemented by providing regional offices with moderate sized minicomputer systems. (It is anticipated that no large equipment room facilities would be required for this network.) These systems can furnish in-house capability for managing and analyzing regional databases. They can also serve as links to both the national office and LBL over a computer network for summary level reporting and access to multiregional and national databases. Many of the basic hardware and software components for this resource sharing facility are commercially available at reasonable prices. Investigation into implementation details would be undertaken in close cooperation with ETA national and regional office personnel. Certain general utility programs for database management, data entry and editing, analysis, report generation, graphics, and communication protocols would be developed by LBL for installation at regional centers. This would obviate requirements for large systems and applications programming staffs in each region. One or two technician level analysts in each regional office should be sufficient to maintain flexibility for regional problems and ensure smooth operation over the network.

Investigation of the following areas would be required-

- selection of minicomputer systems of appropriate power to

handle regional problems. The size and power of each system may vary according to each region's needs, but compatible operating systems and software utilities must be guaranteed,

- development of communication protocols to provide the facilities for interactive terminals, remote job entry terminals and, where appropriate, host-to-host protocols,
- development of general utility software for routine operations common to each region such as text editing, data entry, data management systems, computer graphics, analysis, etc.,
- development of special purpose programs on a project-by-project basis to provide support on a continuing basis for particular requirements, and
- development of training programs to familiarize regional and national staff with the available facilities.

The initial effort would be devoted to establishing a pilot project consisting of three nodes. This would require the acquisition of three small computer systems located, for example, in Region IX (San Francisco), Region VIII (Denver), and at LBL. LBL's Computer Center will also be connected to the network. The first phase of effort for this pilot network would -

- establish a facility to experiment with and test the various components of the distributed computing system,
- provide a system to develop and install the basic utilities as listed above, and

- provide the ability to determine the scale and scope of the full network.

First phase activities would continue while the second phase begins. During this period, work would be directed toward installing some of the standard applications systems developed or being developed under the SEEDIS program. The SEEDIS databases would be made available during this time. Development of new application programs such as for RAS, Employment Security Automation Plan (an effort by ETA to integrate the employment and unemployment insurance databases), and possibly others would begin.

By the end of the second year, when the pilot system begins to have reasonable operational capability and a proper network configuration is determined, three more nodes would be added. The network would now include the national office and two other regions (possibly Region II, New York, and Region IV, Atlanta). Expanding the system adds complexity to the network configuration, and it is anticipated that new development and improvement to the communication backbone network would be necessary. Also, the development of network monitoring systems would be needed.

During the next 12 to 18 months, it is projected that the remaining regions would be added to the network.

With the addition of many more users in the third year and beyond, it is expected that user demand and system inadequacies will require improvements to existing systems and utilities besides the development of new capability. The maturity of the AAFIS and of SEEDIS will greatly impact this requirement.

If the regional computing needs grow, there are several alternatives for expansion. The centralized systems can expand their capabilities, if that is the direction of growth. If additional requirements for regional computing develop, the small satellite systems can easily be expanded to cope with the growth, either by upgrading the small system or by adding an upgraded system and retaining the small original system as a communications interface.

The Large Centralized Information Systems

ETA must not only create major economic statistical programs but also must draw upon those of other government agencies. ETA, with its focus on highly decentralized operations, must supply considerable information for use in identifying service needs, planning, managing programs, and evaluating operations. These activities are founded in information on people - numbers, race, sex, type of worker, occupational training, where they live and work, and other characteristics. ETA must also keep track of the results it achieves in terms of cost of services, type of service rendered, and number of persons served.

To meet these requirements it is proposed that ETA develop two major data banks - a socio-economic-demographic data bank and an administrative-accounting-financial data bank. The former would provide the basic socio-economic-demographic data needed to plan, operate, and evaluate each major ETA program, while the latter would contain data on funds, number of clients served and their characteristics, etc. These databases will be accessed through the

distributed computer network described above.

1. The SEEDIS Data Bank

The basic databases needed for the Socio-Economic-Environmental-Demographic data bank are the Census of Population, all counts, and the full range and greatest detail of the current employment statistics. Other databases may also be necessary to meet the special requirements of ETA's major operating arms - United States Employment Service (USES), Unemployment Insurance Service (UIS), Equal Employment Opportunity (EEO), Veterans Employment Service (VES), Bureau of Apprenticeship Training (BAT), Community Employment Development (CED) - as well as to carry out such services as job information, program evaluation and legislation development, etc. Fortunately the basic data needed for each of these programs is virtually the same, and the same database can be used. In addition to meeting ETA's own internal needs, the SEEDIS database would also meet the requirements of many ETA affiliates, contractors, and researchers who must, in their work, use ETA, SEEDIS, and AAFIS data. The SEEDIS data banks would be based on the lowest level of geographic detail; for example, the basic building block for the Census files would be the tract. For current employment statistics, at least the county and, if possible, three digit SIC code would be used. The development of SEEDIS into a system providing a wide variety of information needed for ETA's present and future programs requires the accomplishment of the following tasks -

- maintenance of existing systems and databases in response to

changing ETA requirements for information and analysis, and changing computer systems upon which they reside,

- installation of new databases pertinent to programmatic requirements, such as installing the Census and making it available over the 1980 Census of Population and making it available over the network,

- investigation of hierarchical storage systems for very large databases, including the design of hardware configurations, physical data structures, and logical data structures,

- development of methodologies for integrating databases originating from a variety of sources and collection methods into a coherent information system,

- development of data exchange protocols for interagency transmittal of files, in close collaboration with other Federal agencies,

- investigation of methodologies for synthesizing, analyzing, evaluating, and updating databases,

- further development of high-level languages, and graphics techniques, such as the computer mapping system, for retrieving and displaying information especially oriented to remote access of relevant portions of a very large database,

- investigation of technical and administrative methods for cooperating and collaborating with other agencies, such as the Bureaus of the Census and Labor Statistics, in acquiring,

evaluating, analyzing, and disseminating relevant information,

- investigation of procedures for handling confidential data and maintaining data integrity. This is of particular importance in the area of unique database acquisition of sensitive information which can be disseminated only in summary form,
- investigation and development of techniques for analyzing and handling geographically coded databases and their underlying geographic boundary files for map composition and display,
- provision of documentation, consultation, and technical assistance to ETA-sponsored researchers for accessing data and information systems developed as a result of this project, and
- development of generalized resources supportive of anticipated future ETA requirements and applications. This effort supports basic computer science research and development of advanced systems capable of response to anticipated ETA requirements. The intent is to investigate new technologies in hardware and software development which permit more efficient, effective and timely response to future project and programmatic requirements.

It should be noted that many of the research and development activities outlined above relate directly to the requirements of the distributed computer system.

2. The Administrative-Accounting-Financial Information System Data Bank

The principal bases to be stored in this system are the ES-UI, CETA, Job Corps, and apprenticeship program data, as well as special administrative files related to current operational problems. These databases would be available not only to ETA managers but also to ETA contractors, client agencies, and research workers both within and outside the federal government.

The data banks used in the AAFIS and SEEDIS must be anonymous, that is, they must not contain identifiable individual data. It is most important in the design of the databases that civil rights, including the right to privacy and freedom from government surveillance, be rigorously observed in both the spirit and letter of the law. Since the use of computers makes many data processing operations possible, every effort must be made to protect individual civil rights. The simplest and most reliable way of so doing is to accept only summary data, or data structured similar to the Census of Population's Public Use Sample or Current Population Survey.

Organizational Implications for ETA

The development of a distributed computer network, coupled with the creation of the SEEDIS and AAFIS data banks, will complete the process of decentralization of the administration of ETA's programs -- a process which began in 1970. Since information is power, this modernization of the ETA information system will have far reaching effects, both within and outside the organization. For example, it is expected that both control and innovation will be stimulated. Managerial control will be improved as responsibility, in real

terms, is moved downstream to the regional offices, while at the same time national office power over the entire system is retained and enhanced. The analytical powers available to middle and top management, as a result of easy access to the necessary databases, will be many times greater than now available.

The impact of this change in the organization's communication and command system can only be sketched at this time. For example, at the regional office level, there will be an increase in responsibility and accountabiliy for the ETA management information system. The data from ETA's clients, contractors, and associated government agencies will flow to the regional office for editing, processing, and inclusion in the region's own decision-assisting management information system. The current split in responsibility between the regional and the national office with respect to data collection, processing, and ultimate data use will disappear, with the regions becoming totally responsible for these activities, especially for the latter. Since the network will permit the production of an almost infinite array of individually tailored reports, each regional or national office administrator will be able to develop an information system to suit unique local needs.

It is anticipated that the regional staff will require training in the use of computers for everyday work. The need for programmers, computer operators and other specialist computer staff, however, will be minimized because the programs used on the system will be designed to avoid requiring these skills at the Regional Office Level.

It is expected that support available to each level of staff in the typical regional office will be improved. For example, staff analysts will have a powerful array of statistical tools to use for data retrieval, analysis, and display. Management will receive what it believes is necessary to plan, control, and evaluate the orograms under its jurisdiction. The clerical staff will benefit by a considerable reduction in manual operations by being able to input data and produce routine reports directly, without the routine calculating and report typing that are presently required.

At the national office level, the establishment of the network will increase control over regional offices by improving the staff's ability to determine what is going on in the field. Although each region will control its own database, the national office, by direct link to the region's computer, will also have equal access to it and will be able to replicate any regionally designed report. It is expected that the national office's work in the area of data collection will be reduced, as will its data processing activities. As in the case of the regional offices, the powers of the national office staff to do analytical work on the ETA information system will increase. The effect on the number of staff employed will be minimal, but new skills will be required.

In sum, the distributed computer network described above represents a major step toward the imaginative use of computers for the management of employment and training programs. It marks a move away from utilizing hardware for mere clerical automation toward a system designed for high level managerial use. The chief objective is to relieve the ETA manager from toiling with

strangling quantities of paper and endless routine detail to work on the more important and innovative solutions to problems concerned with people, planning, and evaluation. The ETA regional administrator is usually responsible for hundreds of millions of dollars (the Region IX Administrator's budget in FY 1976 was about $1.5 billion). To meet this heavy responsibility, he needs a management information system commensurate with the problems. ETA's current management information system built on the technology of the 1950's -- manual clerical operations, obsolete computers, obsolete computer software -- must give way if the agency is to provide efficient and effective service. The American taxpayers and the job seekers deserve no less.

APPENDIX A:

ESARS RETRIEVAL TECHNICAL DOCUMENTATION

RGNLMIS

TECHNICAL DOCUMENTATION

\+ VERSION 5 - 2AUG76
(VERSION 1 - JAN76)

\+ The character + is used to indicate significant lines which have
\+ been changed or added since version 4 of this document.

\+ (The character - is likewise used between versions 3 and 4.)

Comments may be addressed to

\+ Brad Heckman
\+ Room 3209E, Building 50B
\+ Lawrence Berkeley Laboratory
\+ University of California
\+ (415) 843-2740 X6068 (FTS 451-6068)

or

Wen-Sue Gee
Room 3245, Building 50B
Lawrence Berkeley Laboratory
University of California
x5307 (FTS 451-5307)

(This writeup is in PSS library RGNLMIS, subset DCMNTN)

(UCID-3814)

RGNLMIS

TECHNICAL DOCUMENTATION

\+ - VERSION 5 - 2AUG76
(VERSION 1 - JAN76)

\+ The character + is used to indicate significant lines which have
\+ been changed or added since version 4 of this document.

\+ (The character - is likewise used between versions 3 and 4.)

Comments may be addressed to

\+ Brad Heckman
\+ Room 3209E, Building 50B
\+ Lawrence Berkeley Laboratory
\+ University of California
\+ (415) 843-2740 X6068 (FTS 451-6068)

or

Wen-Sue Gee
Room 3245, Building 50B
Lawrence Berkeley Laboratory
University of California
x5307 (FTS 451-5307)

(This writeup is in PSS library RGNLMIS, subset DCMNTN)

TABLE OF CONTENTS 17 JAN 77

1. +SUGGESTED STEPS IN UNDERSTANDING RGNLMIS 1

2. INTRODUCTION 2

3. OVERVIEW 3

4. +STORAGE OF SOFTWARE AND DOCUMENTATION 4

5. BATCH PROCESSING 11
   5.1 ESARS FORMAT TAPES 12
   5.2 ESARS SUMMARY LEVEL DATA TAPES 13

6. INTERACTIVE PROCESSING DESIGN FEATURES 14
   6.1 OVERVIEW 14
   6.2 MINIMUM RESPONSE TIME 15
   6.3 NONPROGRAMMER INTERACTIVE LANGUAGE 16
   6.4 MAXIMUM UP TIME 17
   6.5 ABORT RECOVERY 18
   6.6 OUTPUT CONTROL 19
   6.7 ONLINE USER FEEDBACK 20
   6.8 UPWARD COMPATIBILITY 21
   6.9 COMPREHENSIVE TESTING 22
   6.10 NO DOWN TIME BETWEEN VERSIONS 23
   6.11 LBL COMPATABILITY 24
   6.12 EXPORTABILITY 25
   6.13 CACHE ACCESS SYSTEM ON THE CDC 6600 26

INDEX 27

Observe "Introduction", "Overview" and "Interactive Processing Design Features" of this writeup.

Observe LBL-MIS writeup NTRACT sections on
"The development of NTRACT subsets",
"Principles of NTRACT programming", and
"Techniques for NTRACT programming".
(PSS LBRY=NTRACT, SS=WRITEUP - upper case barb input).

Observe RGNLMIS USERS' GUIDE.

Run RGNLMIS until familiar with its capabilities on a nonprogrammer level.

Observe rest of NTRACT writeup.

Observe batch processing section of this writeup.

+ Observe detailed documentation of most recent version of RGNLMIS
+ (PSS LBRY=RGNLMIS, SS=NTRACTD - print file).

Observe "Storage of Software and Documentation" chapter of this writeup as necessary.

Observe DOL ESARS handbook as necessary.

This document is primarily designed to lead technical personnel to the software of "RGNLMIS" (the interactive retrieval portion of the Regional Management Information System (RMIS) project) and to explain how it all fits together. The individual pieces of software contain internal documentation including directories of 1) I/O files, 2) important variables and arrays used and 3) subroutines used.

This document is secondarily designed to explain the backround development and design philosophy of "RGNLMIS".

The historical development of the RMIS project, of which the interactive retrieval program, RGNLMIS, and its associated batch programs are but a part, is described in the REGIONAL MANAGEMENT INFORMATION SYSTEM PROJECT REPORT ON FIRST YEAR ACTIVITIES, OCTOBER 1,1974 - SEPTEMBER 30, 1975. Of greatest concern to RGNLMIS system designers are the facts that it presently interactively retrieves data from ESARS summary level reports and that the desired detail level data were not obtained because doing so would have broken the basic ground rule for the RMIS research project, which is "the understanding that the project will in no way interfere with the existing reporting system or the activities of national or state offices..." (See above mentioned report, page 8). This was agreed by the RMIS Advisory Committee to mean (among other things) that LBL would only receive data that is presently produced. To receive detailed records would have meant special processing by the state agencies to remove social security numbers.

The main concern originally expressed by the Advisory Committee re ESARS data was that although it is a "rich" database, the existing reporting system was organized in such a way that 1) it is difficult for users to find any (let alone all) the information existing in the database on subjects of interest and 2) its software is very inflexible to changes in the reports produced, thus producing significant delays. RGNLMIS is designed to allow general data retrieval, thus addressing the first concern. (For example, "What information exists in the database on minority females?") For more detail on how this is done see the "RGNLMIS USERS' GUIDE".

The following technical overview will refer to programs by PSS subset name. These are indexed so one may find other occurances of them in this writeup, such as in which PSS library they reside.

PSS space (GROUP=77,CENSUS70,OWNER=HECKMAN,B) is organized as follows-

LIBRARY BKHGNRL - general files used by other projects as well.

LIBRARY RGNLMIS- contains batch mode files plus the interactive source code file and the user control file for starting the interactive program.

LIBRARIES RGNLMIS2 AND RGNLMIS3 - contain the object code and other files used by the interactive program. Are used alternately as new versions are hung. This allows a smooth transition between versions (with no "down time") and provides a backup version should the new one be so bad one wishes to drop back while doing repairs.

LIBRARY RGNLMIS4 - contains the ESARS reports available for interactive retrieval and the two listings of those reports (sorted by area and date) also available for interactive retrieval.

+ PSS space (GROUP=77,CENSUS70,OWNER=GEE) is organized as follows-

+ The following libraries contain files to convert ESARS data tapes that are not "single report 461R1" files into "single report 461R1" files.

+ C461WR - converts "461W1" into "single report 461R1" files, one area per file.

+ CNRTOT - converts "national and regional totals" files into one file for each region and one for the nation.

+ SNRMST - converts "national master" file into one file per state.

+ SR461R - converts "region 9 states" files into one file per state.

+ SLRGNL - contains source code to position the tapes that have multifiles.

A partial listing of the PSS subsets is given below. Some of these subsets are themselves documentation which will explain other subsets.

	ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
	This writeup	BARB output (ascii)	RGNLMIS	DCMNTN
		BARB input (ascii)	RGNLMIS	DCMNTNB
	RGNLMIS USERS' GUIDE	BARB output (ascii)	RGNLMIS	WRITEUP
		BARB input (ascii)	RGNLMIS	RITEUPB
+ +	Conversion of 9-T EBCDIC (8-bit) to LBL display code	SOURCE CODE	BKHGNRL	EBCASCZ
+ +	Conversion of 9-T ASCII (8-bit) to LBL display code	SOURCE CODE	BKHGNRL	EBCASCZ
	Conversion of LBL display code version of an ESARS "459T1" format "table" file to a form suitable for printing on 132 character width medium so that the ESARS table formats contained therein are apparent to the human eye.	SOURCE CODE	RGNLMIS	C459T1Z
		CONTROL FILE for interactive debugging and running of the source code	RGNLMIS	C459T1Q
	Special fix to the AUG74 MA459T1 "table tape"	SOURCE CODE	RGNLMIS	AAG[illegible]
		CONTROL FILE for interactive debugging and running of the source code	RGNLMIS	AAG[illegible]
	Conversion of an LBL display code version of an ESARS "459T1" format "table" file to random format for interactive retrieval	SOURCE CODE	RGNLMIS	C8TB1Z
		CONTROL FILE for interactive debugging of source code and for doing the actual conversion	RGNLMIS	C8TB1V

ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
Cataloging of ESARS summary report "stubs"	SOURCE CODE	RGNLMIS	CATSTBZ
	CONTROL FILE for interactive debugging and running the source code	RGNLMIS	CATSTBQ
Cataloging of ESARS summary report "headers"	SOURCE CODE	RGNLMIS	CATHDRZ
	CONTROL FILE for interactive debugging and running the source code	RGNLMIS	CATHDRQ
Production of a list of all unique table names on an LBL display code version of an ESARS "461R1" format summary file	SOURCE CODE	RGNLMIS	C461R1Z
	CONTROL FILE for interactive debugging the source code	RGNLMIS	C461R1V
Production from an LBL display code version of an ESARS "461W1" format summary file of 1) a list of all unique table names for the substate areas, 2) a list of all unique table names by area and 3) a dump of a user specified number of areas in a format allowing the tables to be human eye readable	SOURCE CODE	RGNLMIS	C461W1Z
	CONTROL FILE for interactive debugging of source code	RGNLMIS	C461W1V
	CONTROL FILE for running the source code	RGNLMIS	C461W1Q

ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
Conversion of an LBL display code version of an ESARS "461R1" format summary file containing all 4 Federal Region IX states into 4 separate "461R1" format files (one for each state) so they may be processed via control file C461RBQ	SOURCE CODE	SR461R	SR461RZ
	CONTROL FILE for interactive debugging of source code	SR461R	DEBUGC
	CONTROL FILE for running the source code	SR461R	RUNDKC
Conversion of an LBL display code version of an ESARS "461R1" format National summary file into a separate file for each area it contains (all states plus some SMSA's and WIN projects) so they may be processed via control file C461RBQ	SOURCE CODE	SNRMST	SNRMSTZ
	CONTROL FILE for interactive debugging of source code	SNRMST	DEBUGC
	CONTROL FILE running the source code	SNRMST	RUNDKC
Conversion of an LBL display code version of an ESARS "461W1" format summary file to a separate ESARS "461R1" format file for each area it contains so they may be processed via control file C461RBQ	SOURCE CODE	C461WR	C461WRZ
	CONTROL FILE for interactive debugging of source code	C461WR	DEBUGC
	CONTROL FILE for running the source code	C461WR	RUNDKC

ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
Conversion of an LBL display code version of an ESARS "461R1" format National and Regional totals file into a separate file for each area it contains (the Nation, 10 Federal regions plus some SMSA's) so they may be processed via control file C461RBQ	SOURCE CODE	CNRTOT	CNRTOTZ
	CONTROL FILE for interactive debugging	CNRTOT	DEBUGC
	CONTROL FILE for running the source code	CNRTOT	RUNDKC
Positioning via an input directive of a multifile display code input containing ESARS "461R1" format summary reports p@MSTZ, CNRTOTZ or C461WRZ	SOURCE CODE	SLRGNL	SLRGNLZ
	CONTROL FILE for interactive debugging	SLRGNL	DEBUGC
	CONTROL FILE for running the source code	SLRGNL	RUNDKC
Conversion of an LBL display code version of an ESARS "461R1" format summary file to packed-random format for interactive retrieval	SOURCE CODE	RGNLMIS	C8DATAZ
	CONTROL FILE for interactive debugging of source code	RGNLMIS	C8DATAQ
+ conversion of an LBL display code version of an "ESARS DOT" file into a print file	SOURCE FILE	DOTCDS	DOTCDSZ
+	PRINT FILE	DOTCDS	DOTLIST
+	CONTROL FILE for running the source code	DOTCDS	RUNDKC

	ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
	Conversion of an ESARS "raw" 9-T EBCDIC or ASCII "461R1" format summary file to the packed and randomized format for interactive retrieval	CONTROL FILE	RGNLMIS	C461RAQ
+	Same as C461RAQ except input is DSPLYCD instead of EBCDIC or ASCII	CONTROL FILE	RGNLMIS	C461RBQ
+	Same as C461RBQ except input is made into a public file	CONTROL FILE	RGNLMIS	C461RCQ
-	Conversion of an ESARS "raw" 9-T EBCDIC National and Regional totals file into a separate file for each area (the nation, 10 federal regions, plus some SMSA's) so they may be processed via control file C461RBQ or C461RCQ	CONTROL FILE	RGNLMIS	NRDSR
-	Conversion of an ESARS "raw" 9-T EBCDIC National Summary File into a separate file for each area it contains (all states plus some SMSA's and WIN projects) so they may be processed via control file C461RCQ	CONTROL FILE	RGNLMIS	NSDSR
-	Conversion of an LBL display code version of an ESARS 9-T EBCDIC tape containing all 4 Federal Region IX states into 4 separate files (one for each state) so they may be processed via control file C461RBQ	CONTROL FILE	RGNLMIS	R9S
	Documentation of most recent version of the RMIS interactive retrieval program called "RGNLMIS" including the source code, PSSLIST's, listings of many files used by the interactive program and comprehensive input test (meant to be self contained)	PRINT MODE	RGNLMIS	NTRACTD

ITEM DESCRIPTION	ITEM TYPE	PSS LIBRARY	PSS SUBSET
Formation of the public and common files used during initialization of the RMIS interactive program "RGNLMIS", and formation of a mag tape backup of those files	CONTROL FILE	RGNLMIS	PFMAKER

All tapes received at LBL for this project are 9-T EBCDIC or ASCII (8 bit characters). These are referred to as "raw tapes". The first processing step with all raw tapes is to convert them on a character-by-character basis to LBL display code with no alteration to the record file structure (program EBCASCZ).

5.1 ESARS FORMAT TAPES

These tapes contain the actual formats of the ESARS summary reports for a particular time period. After conversion to LBL display code, these "table format" files are transformed to human-eye readable form by program C459T1Z. The display code is then converted to a random disk format (by program C8TBLZ) suitable for interactive retrieval. The display code is also used to update catalogs of ESARS table "stubs" (table data row labels) and "headers" (table data column labels) via programs CATSTBZ and CATHDRZ, respectively. These catalogs are used by the interactive retrieval program RGNLMIS.

5.2 ESARS SUMMARY LEVEL DATA TAPES

The first ESARS summary level data tapes received were copies of the Federally required statewide reports sent to Washington, D.C. The ESARS program which produces these tapes is "461R1" and the record format is documented in Chapter VI of the Department of Labor's "ESARS Handbook". Software was written to process these "single report 461R1" files from their original "raw" 9 track EBCDIC or ASCII state to a packed and randomized form suitable for interactive retrieval (see the control file stored on PSS subset C461RAQ, library RGNLMIS). The processing includes production of 1) a list of the unique table names found in the report, 2) a complete dump of the display code version of the report, 3) statistics about the packed randomized form of the report and 4) an updated list of reports available for interactive retrieval. Since these original "single report 461R1" tapes were received, tapes containing the following data have also been received -

1) substate reports (via ESARS program 461W1),

2) FY74 Region IX statewide reports,

3) statewide reports for the entire nation and

4) National and Regional totals.

All of these tapes have required some level of preprocessing to make them "look like" the single report 461R1 files so that they may be digested by the original processing software (see the programs on PSS subsets C461WRZ, SR461RZ, SNRMSTZ and CNRTOTZ, respectively).

6.1 OVERVIEW

A general idea which is threaded through all the design features is that of making the computer correspond to human efficiency instead of the other way around. This is done 1) because computer time is becoming less expensive while human time is becoming more expensive and 2) to allow human creativity a greater chance to exhibit itself.

This means that "interactive programmers" must go beyond their concern with nonbase 10 number systems, full memory dumps, super "efficient" machine language coding and other technical concerns and involve themselves with the concerns and abilities of nontechnically oriented people who will use their programs. This further strongly implies that programmers' interpretations of such human psychology of machines will significantly form the code over and above their technical programming ability. This is one reason why this chapter is so nontechnical and opinionated (another reason is that the code has been designed to "speak for itself" through internal technical documentation).

6.2 MINIMUM RESPONSE TIME

This is accomplished mainly through the use of overlays to keep the execution field length below 20K octal. It has been our experience that anything longer will begin to result in uncomfortable delays during peak computer center use periods.

Another way that field length is in effect limited is by altering the control file in such a way that other programs are executed and then the original interactive program restarted without the user realizing it.

It should be noted that very little attention has been paid to improving the original efficiency of code written specifically for RGNLMIS. This is because most of the time of an interactive session is spent waiting for human entries so that the cost of terminal connect time becomes the most significant cost when compared to the cost of running the code (why invest expensive programmer time streamlining the code if it won't significantly reduce the cost of a typical session?).

6.3 NONPROGRAMMER INTERACTIVE LANGUAGE

This does not mean concern with Artificial Intelligence (AI). We start with this caveat because we think it is a trap to attempt to make the computer "think" like a human or to attempt to make the computer appear to think like a human. It is a trap 1) because it will result in a gigantic code which will eventually bog down and 2) because it isn't necessary anyway as long as the human knows there is a machine on the other end of the line. It is the writer's feeling that the significant differences between human and electronic computing machine capabilities should be openly accepted, advertized and ever lauded because they are complementary. An interface language between humans and today's computer machinery should allow that complementary relationship to develop as much as possible. Most generally this means that it should allow humans to operate as comfortably as possible so that their creative talents will not be burdened with the noncreative details best handled by today's computers.

A nonprogrammer oriented interactive language does mean that the dialogue should be English like in that human English words should be the medium of expression instead of cryptic computer codes. Additionally, the dialogue should expect human variations of form from one entry to the next (as well as one human to the next!). This includes abbreviations and different spellings and delimitation. In default a response should be given to every logical entry. The dialogue should contain enough generalized as well as specific help or "prompting" to allow self teaching.

We are going to end this presentation of views on nonprogrammer oriented interactive languages with another caveat. Designers may find themselves unable to attain these goals because of technical and/or monetary considerations wholely beyond the consideration of the capabilities of today's machinery. The point is that an interactive language should strive to achieve these goals as much as feasible.

6.4 MAXIMUM UP TIME

This implies that users should be able to "reasonably" assume that they may use an interactive program whenever they want, 24 hours a day every day of the year. What is "reasonable" is by definition moot. This writer feels that the Christmas shutdown is reasonable and that a machinery "crash" is reasonable "now and then". It is also reasonable to have scheduled down time due to hardware PM once or twice a week assuming it's at a "reasonable" time of day (to us that's between 1 and 4 AM).

If you accept this definition of "reasonable" for PM there are levels of serious problems at BKY. Assuming the nonprogrammer interactive user community is not allowed to use the 66C (which is the case presently), they face PM in the 66B only once a week from 0500 to 0845. However, this overlaps an early morning high demand period. This time period becomes 0800 to 1145 for any East Coast users, which is worse. There is, of course, nothing an interactive programmer can technically do about this problem. The problem of PM (and unscheduled maintenance) is even a larger problem with the online storage devices. For example, using only PSS or in particular MSS is definitely not reasonable to the writer because they are just not available often enough. But here, fortunately, the interactive programmer can do something. At the very least an offline backup can be provided. In the case of RGNLMIS, a PSS to disk COMMON file cache system has worked quite well for relatively small amounts of data. What is really needed is the ability of programmers to use all the various hardware devices in the computer center as a transparent storage system. BKY is a long way from that because of 1) the less efficient use of the individual devices such generalization implies, 2) the resources needed to implement such a system and 3) the resources needed to maintain it once constructed. However, a step in that direction would be for application programmers to program the present BKY storage devices so that they would appear in such a transparent manner to end users. Because that is the ultimate goal anyway, perhaps this is even the best approach. The writer has collaborated on a design which is in the process of implementation (see the section on "CACHE Access System" later in this chapter).

6.5 ABORT RECOVERY

If RGNLMIS aborts for any reason, it is designed to tell users that has happened and then restart, allowing them to go on with something else. This helps achieve the goal of allowing the users to stop the program, thus giving them a higher level of control.

6.6 OUTPUT CONTROL

The default operational mode of RGNLMIS is to limit the amount of output resulting from a command, or at least explain that a great deal of output is to follow. This is done by in effect printing a logical but reasonably small amount re their command, and then asking them if they wish to continue. This control may be eliminated for a single command.

RGNLMIS also (in default) gives information about requested data. Users who "only want to see the data" may eliminate such excess feedback for a single command or for all commands until further notice.

There are exceptions and special cases to these "rules". An exception arises in a situation where very long listings are asked for. (The users are forced to say in effect "Yes, I really want all this stuff".) A special case is the STOP command which both terminates program execution and executes the system program "END". If feedback suppression is not indicated by users, the command is not carried out and instead they are told what the results of using the command with feedback suppression would be. (This was done after several users entered "STOP" to try and stop something other than the program and were rudely surprised!) Experienced users may automatically use feedback supression the first time they use the command.

6.7 ONLINE USER FEEDBACK

A complete session record of user entries (boldfaced) and computer output is automatically formed and routed to the RGNLMIS designers. These records, which may contain user comments, are studied to identify bottlenecks in the interface language so they may be broken. In this way the interactive language development is built in to the program so that the designers do not have to concern themselves so much with "second guessing" users. These records also facilitate the creation of statistics on user use patterns.

6.8 UPWARD COMPATIBILITY

An attempt has been made to allow all previous versions of RGNLMIS to be a subset of the present version. This prevents the user frustration of "not being able to do what I did before." Again, this gives users a higher level of control.

6.9 COMPREHENSIVE TESTING

A test has been developed (and expanded with each new system) which a new system must pass before it is made available to users. It includes all classes of previous entries that users have made which were beyond the capability of the program and which did not receive an acceptable response. We agree that it is not possible to "test everything" that a user of your program might enter, but we disagree that you shouldn't <u>try.</u> This is our attempt.

6.10 NO DOWN TIME BETWEEN VERSIONS

This is accomplished primarily by duplicating all interactive files whether they're changed or not. When hang time comes the new startup control file is at first only available to the RGNLMIS programmers. Only after starting the program like a user would and testing the new version with the comprehensive test explained above is this new control file made available to users. At that point the new version is "instantly" available to the next user.

6.11 LBL COMPATABILITY

During 1974 a proliferation of Mathematics and Computing Department data management type projects led to the formation of the Data Management Committee. Its primary goal was to communicate among its members ideas about the past, present and future of such projects at LBL, thus increasing efficiency and (at the least) averting embarassing duplication of effort "in house". The development time of RGNLMIS was significantly decreased by this communication through the efficient exchange of ideas it offered and through the incorporation of the experience already gained by the LBL-MIS project. Users of both RGNLMIS and LBL-MIS would find many similarities in the interactive language. Programmers would find many of the LBL-MIS software "modules" used intact, and others used with slight changes. We said earlier in this chapter that a programmer's concept of how nonprogrammers think about interaction with computers will significantly affect the design of the code. We agree almost completely with the ideas expressed by the designer of LBL-MIS and suggest that they be viewed by anyone becoming involved with RGNLMIS. They may be found in the documentation located on PSS library NTRACT subset WRITEUP (upper case barb input). The ideas expressed in this document are basically additions to those of LBL-MIS, although some are variations on a LBL-MIS theme. The only area in which we are not sure we agree with the LBL-MIS designer is in the generality of any one interactive program. Whereas he seems to be convinced that a program should be limited to one logical task which can be understood in total, we are not certain in our minds that users cannot handle the concept of several logically different tasks being available in a single command list.

6.12 EXPORTABILITY

In the interest of developing a working system as fast as possible at BKY, it was decided to initially tax the BKY system "for all it's worth". Therefore, the RGNLMIS design depends in many instances on the operating system and hardware configuration of BKY.

6.13 CACHE ACCESS SYSTEM ON THE CDC 6600

(To be implemented. See PSS library INTERAC, subset WRITEUP which is ASCII BARB output.)

5 AAG4T1V
5 AAG4T1Z

6 CATHDRQ
6, 12 CATHDRZ
6 CATSTBQ
6, 12 CATSTBZ
8, 13 CNRTOTZ
5 C459T1Q
5, 12 C459T1Z
9, 13 C461RAQ
7, 8, 9 C461RBQ
9 C461RCQ
6 C461R1V
6 C461R1Z
7, 8, 13 C461WRZ
6 C461W1V
6 C461W1W
6 C461W1Z
8 C8DATAQ
8 C8DATAZ
5 C8TBLV
5, 12 C8TBLZ

5 DCMNTNB
5 DCMNTN
7, 8 DEBUGC
8 DOTCDSZ
8 DOTCDS
8 DOTLIST

5, 11 EBCASCZ

26 INTERAC

9 NRDSR
9 NSDSR
9 NTRACTD
1, 24 NTRACT

10 PFMAKER

8, 11 RAW TAPES
4 RGNLMIS2
4 RGNLMIS3
4 RGNLMIS4
4 RGNLMIS
5 RITEUPB
7, 8 RUNDKC
9 R9SRT

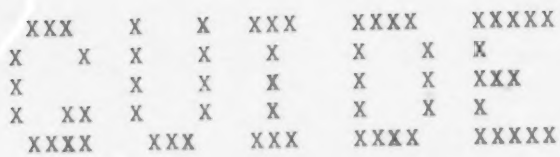
8 SLRGNLZ
8, 13 SNRMSTZ
7 SNRMST

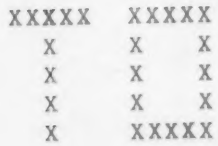
7, 8, 13 SR461RZ

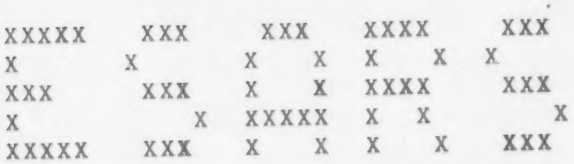
5, 24 WRITEUP

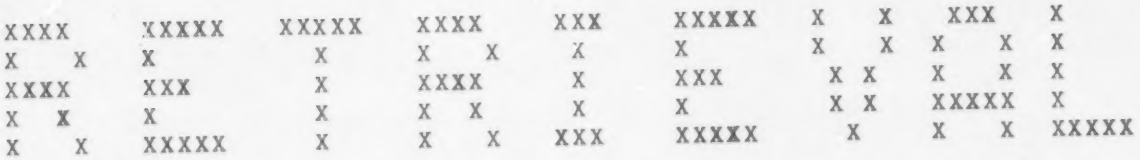
APPENDIX B:

GUIDE TO ESARS RETRIEVAL









+ (A Lawrence Berkeley Laboratory SEEDIS Subsystem)

Version 4 - 17NOV76
(Version 1 - 30JUN75)

The character + is used to indicate significant lines which have been changed or added since Version 3 of this guide.

(The character - is likewise used between Versions 2 and 3.)

Comments may be addressed to

Bradford Heckman
Room 3209E, Building 50B
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca 94720
(415) 843-2740 x6068 (FTS 451-6068)

or

Wen-Sue Gee
Room 3245, Building 50B
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca 94720
x5307 (FTS 451-5307)

(This writeup is in PSS library RGNLMIS, subset WRITEUP)

TABLE OF CONTENTS 17 JAN 77

1. +INTRODUCTION 1

2. OVERVIEW OF THE DATA 2

3. OVERVIEW OF THE DATA RETRIEVAL 3
   GENERAL DATA RETRIEVAL 3
   SPECIFIC DATA RETRIEVAL 3

4. OVERVIEW OF THE HUMAN-COMPUTER INTERACTIVE PROCESS 4
   YOU ARE IN COMMAND 5
   YOU CAN'T HURT IT 5
   PRACTICE MAKES PERFECT 6
   ONLY YOU CAN IMPROVE IT 6

5. + OVERVIEW OF THE COMMANDS AVAILABLE 7

6. + EXAMPLE OF A HUMAN-COMPUTER INTERACTIVE SESSION 8

INDEX 11

This document is designed to ease you into the initial use of ESARS interactive retrieval at the Lawrence Berkeley Laboratory (LBL). It assumes that you know nothing about computers or the database at LBL. Although this guide may appear thick, note that + most of it is reference material contained in appendices.

+ This retrieval capability has been developed as part of an + overall Socio-Economic-Environmental-Demographic Information System (SEEDIS). Thus it is referred to as a "subsystem".

The purpose of this interactive subsystem is to allow the retrieval of data of interest immediately upon request. This is done by allowing you to control a computer as it operates by entering commands at a terminal (which may be thousands of miles away from the computer). The interactive retrieval subsystem is composed of many things, namely

1) the users who retrieve the data,
2) the computer programmer,
3) the computer program,
4) the machinery in the LBL computer center,
5) the terminals attached to the LBL computer center, and
6) the data.

It might surprise you to see people (numbers 1 and 2) listed as part of the "subsystem." This was done because the writers feel that human psychology is a very significant factor in the development of human-machine interaction.

Learning to use the interactive subsystem is analagous to learning a new language, albeit a simple one. This means that you can expect to begin using the subsystem very quickly, just as you can very quickly learn a few words in a new language. However, it also means that it is unreasonable to expect to know all the capabilities of the interactive subsystem before you begin to actually use it. These capabilities are best learned through mimicry of what others have done and experimentation with what + seems to make sense. Therefore, THE MAIN THRUST OF THIS DOCUMENT IS THE EXAMPLE OF ACTUAL ESARS RETRIEVAL which should allow you to connect a terminal to the computer center and start the subsystem and begin to "get the feel" of using the system by mimicking some of the processes displayed.

The development of this interactive subsystem began during a project undertaken in collaboration with the Department of Labor, Employment and Training Administration Federal Region IX office (Arizona, California, Hawaii, and Nevada).

OVERVIEW OF THE DATA

The data available for retrieval are from the Employment Security Automated Reporting System (ESARS). The source of ESARS data is the Employment Security (ES) Offices located throughout the nation. (These offices may be known to the reader as "State employment service offices".) The end product of ESARS is a set of reports (by area and month) Which summarize the data obtained from the forms people fill out when they use the ES offices. The ESARS database available at LBL may be thought of as a computerization of these reports. If you are familiar with them you need not read the rest of this chapter, for it describes the form of the reports just enough for those not familiar with them to use the interactive subsystem.

The reports are composed of tables, all of which have 1) a name, 2) "headers" across the top of the table labeling the data columns, and 3) "stubs" down the left side of the table labeling the data lines. Although it is not necessary to know the exact appearance of the tables to use the interactive subsystem, their actual formats will become apparent as you do.

It is important to keep in mind that the contents of the reports change with area and report period in two ways. First, all possible ESARS tables are never produced in one report, but vary with area and time period. Second, the format of the reports are altered at least once a year so that, for example, a stub might change or completely disappear from one time period to another. In fact, entire tables may appear and disappear. (This does not happen between area reports for the same time period).

In order to retrieve data you must first specify a single report (a specific area, month and year). A new report may be request at any time during an interactive session.

GENERAL DATA RETRIEVAL

Because the monthly ESARS reports tend to be quite large, traditionally it has been difficult for humans to look at them and feel assured that they have found all the information they are particularly interested in. Therefore, this interactive subsystem is being developed primarily to apply the power of a computer to answer the question, "What information is available in the ESARS data base on subject X?". This is done by returning only those tables or portions of tables which contain the data of interest. This in turn is made possible by the following scheme.

The interactive subsystem remembers which ESARS table(s) contain a particular stub. (See the appendices for an alphabetical (almost) list of these stubs.) The interactive subsystem can therefore print the data associated with a particular stub (that is, the table headers and a single line of data) for each table which contains that stub. You may ask the subsystem to do this by specifying the "LBL code" (the number at the beginning of the line) corresponding to the stub of interest to you in the list found in the appendices.
Because the stub list is too long to easily search through manually, the subsystem is designed to aid you in automatically scanning it for all stubs which contain information of interest.

A similar procedure allows you to print out a single column of data from all tables for a header of interest to you. The subsystem remembers which ESARS table(s) contain a particular header (see header list in appendices), aids you in finding headers of interest, and allows printout of the actual data.

The interactive retrieval subsystem can also aid you in finding table names which contain information you're interested in (see appendices for list of ESARS table names). For example, there are few ESARS stubs or headers which contain the words "food stamp," although there is an entire table about food stamp applicants.

SPECIFIC DATA RETRIEVAL

The interactive subsystem also allows you to print out data from a specific portion of a report when you already know you want it. That is, you may print out a specific table or line from a table.

A goal of this entire document is to make a person about to use the interactive retrieval subsystem feel at ease, and this chapter is especially written with that goal in mind. (It is not an accident that very little computer terminology appears in this document and that the first person is predominantly used.) If you do not feel apprehensive about the idea of sitting down at a terminal to communicate with a computer you might just as well go to the example at this time and give it a try.

I have come to believe that in our culture technically oriented people (hereafter referred to as "technologists") generally like to snow nontechnologists (human nature perhaps?), but at the same time nontechnologists **like to be snowed** by technologists (more surprising?). I feel the basic reason for the latter phenomenon is the nontechnologists' (the vast majority of our citizens) belief that our society is much more technologically advanced than it really is. They **want** to be dazzled by our technology. They **don't want** to believe that they can understand a great deal of it. Nowhere is this phenomenon more apparent than between those on different sides of the electronic computing fence. The basic concepts which make all of today's practical computers tick are quite easy for the non-trained-in-technology mind to understand, and there has been very little change in these concepts since electronic computers were first built. What has changed is the **speed** at which the machinery does its simple thing, thus giving the illusion of increased complexity because it can do more and more marvelous things for us, such as make the human-machine interaction presented herein practical. But mention the word "computer" and most nontechnologists will picture some type of incredibly complicated machine with tons of knobs, switches, spinning wheels and blinking lights. Talk about setting them down at a terminal to communicate with a computer, and they will likely laugh or break out in a cold sweat. If you identify with such feelings, I **assure** you that you need not be a technologist to use a computer to retrieve data any more than you need to be a mechanic to use an automobile. It is up to technologists to make the internal workings of machines invisible so they can be used efficiently by nontechnologists. This is an ideal that we are working toward at LBL with the development of this SEEDIS interactive retrieval subsystem for ESARS data.

When you first become involved with this subsystem, you will probably find that the startup procedure is a significant portion of your interactive sessions and no small amount of frustration may be felt. However, you may reasonably expect these details to become more automatic each time you start a session until they become insignificant.

When you are interacting with the computer as part of the subsystem, I claim there are just two concepts you need to be aware of at all times to be successful, namely that <u>you are in command</u> and that <u>you can't do anything to hurt the subsystem.</u>

YOU ARE IN COMMAND

Your interaction with the computer is based upon 1) you giving a command, 2) the computer possibly clarifying what it is you want it to do, and 3) the computer carrying out the command. You may give a command **anytime** the computer is not responding to you. You may also **at any time** stop the computer from carrying out a partly finished command if you decide that is what you desire.

YOU CAN'T HURT IT

I have found that many users freeze up at a terminal's keyboard because they are afraid of "making a mistake", embarassing themselves or destroying something. This subsystem is designed to treat all your entries as unexpected and to always give a response (unless you have specifically asked it not to respond). In other words, it **expects you to make mistakes** because you are a human. You cannot physically hurt any part of the subsystem by pushing terminal keys, unless you push them with a sledge hammer. Even if the program should "blow up" due to a programming error, the subsystem is designed to tell you that has happened and restart with little or no effect on what you had previously done so that you may continue the session doing something else if you wish.

This concept of not worrying about "hurting" the system is important because it is probably the major obstacle in the path of your spontaneity in interacting with the computer. This interactive subsystem has been designed for user spontaneity because it seems to be a major aspect of human natural processing modes. Human thinking does not seem to proceed from one well defined step to another as computer processing tends to do. Instead there seems to exist a significant amount of less than rational hopping around as more interesting and/or exciting avenues are sensed at many mental turns. This interactive subsystem is designed to make the computer serve human efficiency, and not the other way around. This is a practical application because human time is becoming more expensive and computer time less expensive.

Other features of the subsystem which are designed to increase your spontaneity and therefore allow you more comfort and in turn more results are 1) very short response time to user entries, and 2) little mental strain required for the details of using the system. The first is a matter of design efficiency. The second involves the computer being forgiving and graceful in response to your entries. The interactive subsystem attempts to not be too fussy about spacing, spelling and even abbreviations.

So much for the two concepts you need to keep in mind at all times. Now I'll explain a couple you should be reminded of now and then.

PRACTICE MAKES PERFECT

Because of the flexibility the subsystem offers you, explaining everything it can do rapidly becomes like listing all the sentences possible in the English language. Once you understand what a command will do, you will learn through experience new ways to use it to retrieve data of interest to you.

ONLY YOU CAN IMPROVE IT

If you have looked at the example, you may already realize that the subsystem provides a mechanism for user feedback to the designers. This subsystem has evolved and will continue to evolve based upon the experience of those who have and will use it. This is why the people involved with the subsystem are considered part of the subsystem. Humans know much about computer processing but (probably) little about human mental processing and even less about human-machine interactive processing. Until we do know much more about the latter, the most efficient method to develop human-machine interactive systems is through very close communication between you the user and the designers from the very beginning of development.

This means that you should expect the system to change from time to time, hopefully for the better, sometimes dramatically. You can tell if a new version exists when beginning a session by comparing the version number given with that of your last session. A number change suggests some major change such as a new command. A letter change suggests an internal change not visible to you or at most a minor visible change, such as fixing something wrong (that is, making the program do what's already advertised).

There are two types of commands, both of which may be given at any time the computer is not responding. The first type is available to all people (subsystem users or otherwise) who are connected via a terminal to the LBL computer center. These commands are referred to in this guide as "computer center commands". They begin with a "greater than" sign(>) or an "at" sign(@). These commands are in the index (which will usually lead you to the appendix on miscellanous good stuff to know), and nothing more will be said about them in this chapter. The other type of command is available after you connect a terminal to the computer center and startup the interactive program. These are referred to as "the subsystem commands". A brief description of each of these is given below. These commands all appear in the index of this guide, which will usually lead you to the example where you may see them actually used. Remember that all commands available to you may be entered at any time the computer is not responding (printing something).

HELP — Gives an overview of the interactive system at the terminal, primarily for the inexperienced user.

+ GET — Retrieves a particular ESARS report (a specific area type, area code, area, month and year) in its entirety but prints none of the data from it. Commands which actually print out data retrieve the data from the last report specified with a "GET" command.

SCAN — Helps you find characters (from a list you specify) which correspond to information you are interested in.

- PRINT — Prints data corresponding to a stub or header for each ESARS table which contains that stub or header. Also prints data for particular tables and lines from tables.

WHAT — Retrieves no data, but gives various useful information.

* — Tells the interactive program to ignore the rest of the line, because it is a user comment.

SESAME — Allows a user to start other interactive retrieval programs available at LBL without stopping one computer "job" and starting another.

STOP — Ends the interactive program, but does not disconnect you from the computer center (the latter is done by hanging up the telephone).

```
      >LOG,SEEDIS,12,500.<ACC NO>,GEE,W
      LOGIN  CP-12  TTY-077  14.27.56.**BKY61K*B*10/08/76.
      SEEDI02 LOGGED IN.  SESAME 2.4
      OK - SESAME
+     ↑LOAD,ESARS,SEEDIS
      LOAD COMPLETE, ENTERING ↑EDIT
      OK - ↑EDIT
      ↑RUN
-     ESTIMATED TIME FOR STARTUP OF ESARS IS 60 SECONDS(14.28.34.)...
-     STARTUP IN PROGRESS(14.28.37.)...
-     STARTUP IN PROGRESS(14.28.39.)....
-     STARTUP IN PROGRESS(14.28.43.).....
-     STARTUP IN PROGRESS(14.28.50.)......
-     STARTUP IN PROGRESS(14.28.53.).......
-     STARTUP IN PROGRESS(14.28.56.)........
-     STARTUP IN PROGRESS(14.28.58.).........
-     STARTUP FROM FASTEST DEVICE (DISK) FAILED...
-     WILL ATTEMPT STARTUP FROM NEXT FASTEST DEVICE (PSS)...
-     ESTIMATED TIME FOR STARTUP IS NOW 3-5 MINUTES(14.29.11.)...
-     STARTUP IN PROGRESS(14.29.22.)...
-     STARTUP IN PROGRESS(14.32.18.)....
-     STARTUP IN PROGRESS(14.32.48.).....
-     STARTUP IN PROGRESS(14.33.01.)......
-     STARTUP IN PROGRESS(14.33.31.).......
-     STARTUP IN PROGRESS(14.34.20.)........
-     STARTUP IN PROGRESS(14.34.37.).........
-     STARTUP IN PROGRESS(14.34.58.)..........
-     STARTUP IN PROGRESS(14.35.10.).........
-     STARTUP IN PROGRESS(14.35.37.)........
-     STARTUP IN PROGRESS(14.36.07.).......
-     STARTUP IN PROGRESS(14.36.23.)......
-     STARTUP IN PROGRESS(14.37.42.).....
-     STARTUP IN PROGRESS(14.39.00.)....
-     STARTUP IN PROGRESS(14.39.52.)...
-     PLEASE STAND BY FOR ESARS(14.39.58.).....
-     ******************************************`
-
-
-     LBL RGNLMIS VERSION 7B (EFFECTIVE 25AUG76)


      DATE/TIME- MONDAY     08 OCT 76 14.40.26
      YOU MAY ENTER THE CHARACTER ↑ FOR A LIST OF COMMANDS
      (ALL YOUR LINES SHOULD END BY DEPRESSING THE 'RETURN' KEY)
      AT YOUR COMMAND.
      * THIS CHAPTER IS AN ACTUAL RECORD OF A USER'S INTERACTION WITH A
-     * COMPUTER VIA THE SUBSYSTEM.  IN THIS CASE THE USER HAPPENS TO BE WEN-SUE
-     * GEE, ONE OF THE SYSTEM DESIGNERS.  I WILL ATTEMPT TO DEMONSTRATE HOW
      * THE INTERACTIVE PROCESS WORKS WITH THE SUBSYSTEM BY USING SOME, BUT NOT
      * ALL, OF THE CAPABILITIES OF THE SUBSYSTEM.  ALL OF THE ENTRIES
      * (COMMANDS, RESPONSES AND COMMENTS) THAT I ENTERED AT MY TERMINAL'S
      * KEYBOARD ARE IN BOLDFACE TYPE, WHILE ALL OUTPUT FROM THE COMPUTER IS
      * IN LIGHTER TYPE.  ALL LINES WHICH I ENTERED ENDED WITH A CARRIAGE
      * RETURN.  (AN EXCLAMATION POINT IS PRINTED FOR A CARRIAGE RETURN
      * AT A TERMINAL, BUT THAT IS NOT REFLECTED IN THE RECORD.)
```

```
* FROM THE OUTSET WE WOULD LIKE USERS TO BE AWARE THAT THE SUBSYSTEM HAS
* BEEN AND WILL CONTINUE TO BE DEVELOPED THROUGH USER FEEDBACK.  THIS
* IS FACILITATED BY OUR STUDY OF INTERACTIVE SESSION RECORDINGS (SUCH
* AS THIS ONE) WHICH ARE AUTOMATICALLY FORMED AND SENT TO US WHEN YOU
* FINISH WITH AN INTERACTIVE SESSION.  NOW THAT YOU KNOW THIS, WE HOPE
* YOU WILL BE LESS INHIBITED, IF NOT MOTIVATED, TO COMMUNICATE YOUR
* QUESTIONS, SUGGESTIONS AND ANY REASONS FOR CONFUSION TO US DURING
* THE COURSE OF A SESSION WHEN SUCH COMMENTS ARE FRESHEST IN YOUR
* MIND.  IF YOU WOULD LIKE TO TALK IN PERSON ABOUT YOUR SESSION, FEEL
* FREE TO LEAVE YOUR NAME AND PHONE NUMBER IF WE DON'T ALREADY HAVE IT.
* (PLEASE BEGIN ALL COMMENT LINES WITH AN ASTERISK (*), OTHERWISE OUR
* PROGRAMMING WILL ASSUME YOU ARE TRYING TO TELL IT TO DO SOMETHING
* AND WILL PROBABLY GIVE YOU A SILLY RESPONSE.)
*
* IF YOU HAVE LOOKED OVER THE CHAPTERS PRECEDING THIS ONE, YOU MAY
* ALREADY REALIZE THAT ONE OF THE DESIGN GOALS OF THE SUBSYSTEM IS TO
* ALLOW YOU TO LEARN AS MUCH AS POSSIBLE AS YOU GO.  THEREFORE, I AM
* ATTEMPTING TO KEEP THESE INITIAL COMMENTS TO A MINIMUM.  JUST A
* FEW WORDS OF EXPLANATION ABOUT THE STARTUP PROCEDURE AND THEN WE'LL
* TRY TO ACTUALLY RETRIEVE SOME DATA.
*
* AFTER YOU HAVE CONNECTED YOUR TERMINAL TO THE LBL COMPUTER CENTER
* (SEE APPENDICES), YOU MAY ENTER THE FIRST THREE  BOLDFACE LINES OF THIS
* EXAMPLE TO GET THE INTERACTIVE SESSION UNDER WAY.  IN THE FIRST LINE
* YOUR NAME SHOULD REPLACE MINE, AND THE CHARACTERS <ACC NO> SHOULD
* BE REPLACED WITH YOUR 6 DIGIT ACCOUNT NUMBER (FOR ASSISTANCE IN
* OBTAINING AN ACCOUNT NUMBER YOU MAY CONTACT SUZANNE KRANZ OF LBL
* AT 415-843-2740 X5596).  PLEASE WAIT FOR THE COMPUTER RESPONSE
* "OK - SESAME" BEFORE YOU ENTER THE SECOND LINE.  AFTER ENTERING
* THE SECOND LINE, PLEASE WAIT FOR THE RESPONSE "OK - ↑EDIT" BEFORE
* ENTERING THE THIRD LINE. AFTER ENTERING "↑RUN", IF YOU RECEIVE
* SOME OTHER RESPONSE THAN "ESTIMATED TIME FOR STARTUP OF RGNLMIS IS
* 60 SECONDS" (INCLUDING NO RESPONSE WITHIN A MINUTE), SOMETHING IS
* PROBABLY WRONG, AT WHICH POINT YOU MAY REFER TO THE APPENDICES FOR
* HELP.  THE "STARTUP IN PROGRESS" LINES ARE PRINTED OUT TO LET YOU
* KNOW THAT SOMETHING IS HAPPENING DURING THE FEW MINUTES OF INITIA
* IZATION.  AS IS INDICATED AFTER THE SIGN-ON INFORMATION, YOU MAY
* ENTER THE CHARACTER ↑ TO OBTAIN A LIST OF COMMANDS.  THIS
* MAY BE DONE AT ANY TIME DURING THE SESSION AS MANY TIMES AS YOU LI
↑
-                -- COMMANDS CURRENTLY AVAILABLE --
-    HELP       (VIA SEVERAL PAGES OF INTRODUCTION WITH EXAMPLES)
-    WHAT       (IS GENERAL INFORMATION AVAILABLE AT TERMINAL?)
-    SCAN       (THE LINES OF A LIST FOR PARTICULAR CHARACTERS)
-    RESCAN     (THE RESULTS OF THE LAST SCAN OR RESCAN COMMAND)
-    GET        (AN ESARS SUMMARY REPORT, BUT DO NOT LIST IT)
-    PRINT      (A PORTION OF THE SUMMARY REPORT LAST RETRIEVED)
-    *          (ACCEPT THIS LINE AS A COMMENT TO BE SEEN LATER)
-    SESAME     (LEAVE THE SUBSYSTEM AND GO BACK TO SESAME)
-    STOP       (THE SUBSYSTEM AND DISCONNECT MY TERMINAL)
-    -- END OF COMMAND LIST --
* THIS LIST WILL CHANGE AS WE RECEIVE FEEDBACK FROM USERS AS TO WHAT
* COMMANDS YOU NEED TO INCREASE YOUR ABILITY TO RETRIEVE INFORMATION
* YOU ARE INTERESTED IN.
*
```

```
      * MOST OF THE COMMANDS INVOLVE OPTIONS WHICH YOU MAY SPECIFY.
      * IF YOU DO NOT ENTER OPTIONS AFTER A COMMAND, OR IF OUR PROGRAMMING
      * IS NOT ABLE TO TELL WHAT YOU ARE SPECIFYING, YOU WILL BE PROMPTED
      * FOR THE REQUIRED INFORMATION.  ONE NICE APPLICATION OF THIS
      * CAPABILITY IS FOR INITIAL USERS WHO ARE NOT SURE WHAT TO ENTER
      * WITH A COMMAND, BECAUSE THEY NEED ONLY ENTER THE COMMAND ITSELF AND
      * BE HELPED WITH THE SPECIFICATION OF OPTIONS.  LET'S TRY A
      * COMMAND ON THE LIST AND SEE WHAT HAPPENS...
+     GET
+     ENTER AREA TYPE WANTED, OR (WHAT ARE AREA TYPES?)
+     WHAT ARE AREA TYPES?
+     'AREA TYPES' ARE
+          '1' OR 'N' FOR NATIONAL TOTAL
+          '2' OR 'R' FOR REGIONAL TOTAL
+          '3' OR 'S' FOR STATEWIDE
+          '4' OR 'SMSA' FOR SMSA
+          '5' OR 'C' FOR COUNTY OF RESIDENCE
+          '6' OR 'AD' FOR ADMINISTRATIVE DISTRICT
+          '7' OR 'L' FOR LOCAL OFFICE
+          '8' OR 'AR' FOR AREA OF STATE
+          '9' OR 'W' FOR WIN PROJECT
+     BUT AREA TYPES 4 THROUGH 9 NOT QUITE READY FOR RETRIEVAL.
+     AT YOUR COMMAND.
+     GET S
+     ENTER AREA WANTED
+     (STATE OR FIPS CODE FOR STATE
+       OR 'WHAT ARE STATES?')
+     NEW YORK
+     ENTER MONTH WANTED
+     JULY
+     ENTED YEAR WANTED
+     1976
+     WILL ATTEMPT RETRIEVAL OF THE REPORT FOR JUL, 76, NY, STATEWIDE...
+         THE REPORT HAS NOT BEEN STORED FOR INTERACTIVE RETREVAL,
+     YOU MAY ENTER 'WHAT ARE REPORTS?'
+     AT YOUR COMMAND.
+     *NOTE THAT BY BEING SPONTANIOUS AT THE TERMINAL AND NOT WORRYING
+     *ABOUT "DOING SOMETHING WRONG", THIS USER HAS NOT ONLY BEEN ABLE
+     *TO LIMP THROUGH THE SPECIFICATION OF OPTIONS FOR THIS COMMAND,
+     *BUT WAS GIVEN SOME SUGGESTIONS ABOUT WHAT TO DO NEXT WHEN THE
+     *COMMAND FAILED TO DO WHAT WAS SPECIFIED.

+     *IT IS POSSIBLE THAT LESS THAN IMMEDIATE REPONSE WILL BE RECEIVED
+     *DURING THE BUSIEST PORTION OF THE DAY, WHICH IS MID AFTERNOON,
+     *BERKELEY TIME (REMEMBER THAT YOU ARE SHARING THE COMPUTER CENTER
+     *RESOURCES WITH HUNDREDS OF OTHERS AT THAT TIME.)
+     *

+                  **********END OF EXCERPT**********
```

9 ACCOUNT NUMBER - HOW TO OBTAIN

9 CARRIAGE RETURN
7 COMMANDS - FOR THE LBL COMPUTER CENTER
7 COMMANDS - FOR THE SUBSYSTEM
7 COMPUTER CENTER COMMANDS

2 ES - "EMPLOYMENT SECURITY" (OFFICES)
2 ESARS DATA - VOLATILITY OF
8 ESARS RETRIEVAL SUBSYSTEM STARTUP PROCED
1 ESARS RETRIEVAL SUBSYSTEM-MEANING OF
2 ESARS - MEANING OF

6, 9 FEEDBACK - USER TO DESIGNER

7 GET REPORT - AN ESARS RETRIEVAL COMMAND

2 HEADERS
7 HELP - AN ESARS RETRIEVAL COMMAND

7 INTERACTIVE RETRIEVAL SUBSYSTEM COMMANDS

3 LBL CODES

7 PRINT - AN ESARS RETRIEVAL COMMAND

3, 7 REPORTS
9 RETURN KEY

7 SCAN - AN ESARS RETRIEVAL COMMAND
1 SEEDIS
7 SESAME - AN ESARS RETRIEVAL COMMAND
4, 8 STARTING AN INTERACTIVE SESSION
7 STOP - AN ESARS RETRIEVAL COMMAND
5 STOPPING OUTPUT (BEFORE IT STARTS)
2 STUBS

6 VERSION NUMBER - OF ESARS RETRIEVAL SUBS

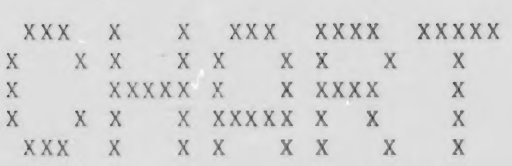
7 WHAT ARE - AN ESARS RETRIEVAL COMMAND
7 WHAT IS - AN ESARS RETRIEVAL COMMAND

7, 9 * - AN ESARS RETRIEVAL COMMAND

9 _ - TO PRINT A LIST OF THE SUBSYSTEM COM

APPENDIX C:

CHART USERS' GUIDE



USERS' GUIDE
NOVEMBER 1976

BILL BENSON
50B - 2239
LAWRENCE BERKELEY LABORATORY
(415)-843-2740 X5703

TO GET A COPY OF THIS WRITEUP, DO
LIBCOPY,GPL,TEMP/RR,CHBARB.
BARB,TEMP.

TABLE OF CONTENTS 18 JAN 77

1. ACKNOWLEDGEMENT 1

2. INTRODUCTION 2

3. DATA ANALYSIS CAPABILITIES 3

3.1 HOW IS THE DATA RELATED TO THE VISIBLE DISPLAY? 3

3.2 DATA SELECTION AND CALIBRATION 4

3.3 PROCESS OF FORMING PROFILES 5

3.4 BOARD MANIPULATION 6

4. GRAPHIC DISPLAY CAPABILITIES 7

4.1 MATRIX DISPLAYS 7

4.2 CHART DISPLAYS 8

4.3 TITLES AND LABELS 9

HIERARCHICAL LABELS 9

5. LANGUAGE SYNTAX 11

5.1 KEYWORDS AND NUMBERS 11

HELP(?) 11

5.2 MISSING DATA 12

5.3 ARITHMETIC EXPRESSIONS 13

CHART WAS DEVELOPED IN PARALLEL WITH ANOTHER SIMILAR PROGRAM, MATBOARD, BY BERNARD KITOUS. MATBOARD IS AN INTERACTIVE SYSTEM DESIGNED TO AID DECISION MAKING USING MATRIX DISPLAY TECHNIQUES. MUCH OF MATBOARD HAS BEEN INCORPORATED INTO THE PRESENT PROGRAM AND THERE IS CONSIDERABLE OVERLAP BETWEEN THE TWO, ALTHOUGH SIGNIFICANT PORTIONS REMAIN UNIQUE TO MATBOARD.

THE MATBOARD USERS' GUIDE GIVES AN EXCELLENT AND HIGHLY READABLE EXPOSITION OF THE DATA ANALYSIS AND DISPLAY CAPABILITIES AVAILABLE. SINCE DETAILS DIFFER, HOWEVER, THE PRESENT USERS' GUIDE SHOULD BE THE REFERENCE WHEN USING CHART.

THIS PROGRAM COMBINES TWO BASIC CAPABILITIES - EXPLORATORY DATA ANALYSIS AND DATA PRESENTATION IN THE FORM OF MATRIX DISPLAYS, AND OTHER GRAPHIC FORMS SUCH AS BAR CHARTS, PIE CHARTS, AND LINE GRAPHS. IT IS DESIGNED TO BE RUN INTERACTIVELY AND DISPLAY PICTURES ON A GRAPHICS TERMINAL OR HARDCOPY GRAPHICS DEVICE SUCH AS MICROFILM RECORDER. INTERACTION IS EMPHASIZED BECAUSE BOTH EXPLORING THE DATA FOR MEANINGFUL PATTERNS AND PRESENTING CLEAR AND CONVINCING CHARTS ARE ITERATIVE PROCESSES.

THESE PROCESSES START WITH TABULAR DATA. TABLES MAY BE ENTERED DIRECTLY FROM THE TERMINAL DURING AN INTERACTION OR RETRIEVED ON DEMAND FROM A PREVIOUSLY PREPARED LIST OF TABLES. SUCH A TABLE IS TERMED A **RAW** DATA BOARD.

WHERE APPROPRIATE, A **PROFILE** DATA BOARD MAY BE DERIVED FROM THE RAW DATA. THIS MAY BE DONE BY COMPARING ALL ROWS (OR COLUMNS) TO A STANDARD REFERENCE ROW (OR COLUMN). THE REFERENCE MAY BE COMPUTED FROM THE DATA, SUCH AS SUMS AND AVERAGES, OR DEFINED EXPLICITLY, SUCH AS A THRESHOLD. TYPICALLY, PROFILES MAY BE COMPUTED AS PERCENTS OF TOTAL, DIFFERENCE FROM AVERAGE OR THRESHOLD, AND PERCENT DIFFERENCE FROM AVERAGE OR THRESHOLD.

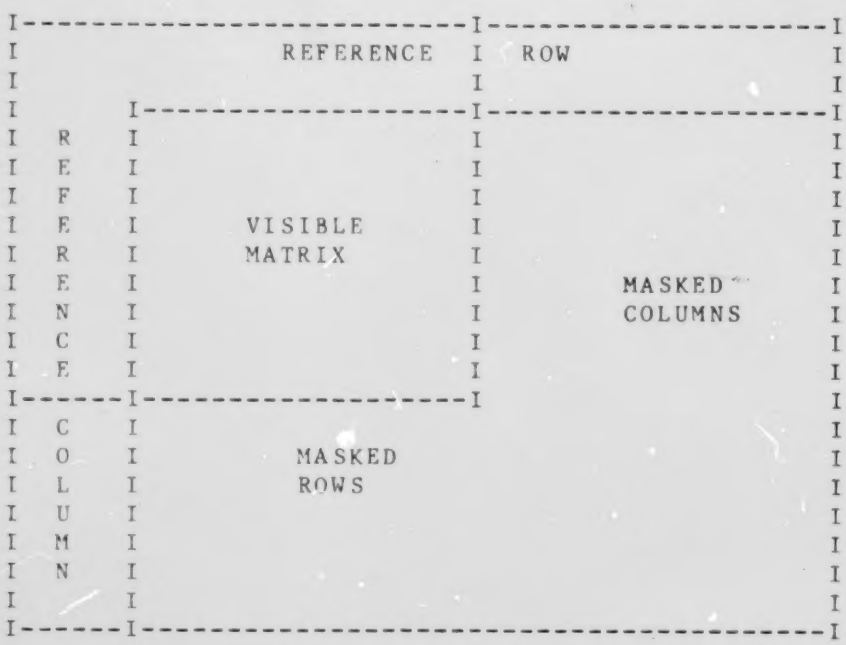
BOTH THE RAW BOARD AND PROFILE BOARD MAY BE MANIPULATED. THAT IS, ROW AND COLUMN ENTRIES MAY BE REARRANGED, PUT IN A DIFFERENT SEQUENCE, PUT IN GROUPS, ETC.

A VARIETY OF GRAPHIC DISPLAYS MAY BE USED TO REPRESENT THE TWO BOARDS. THE MOST DIRECT REPRESENTATION IS A MATRIX DISPLAY, THAT IS, THE NUMERICAL DATA TABLE IS TRANSLATED INTO A MATRIX OF GRAPHIC ITEMS. IN GENERAL, THE VISUAL VARIABLE USED IS SIZE (OF A SPOT OR A BAR). BOTH THE DATA AND THE GRAPHIC ITEMS MAY BE SCALED IN A VARIETY OF WAYS TO HELP FOCUS ON A PARTICULAR RANGE OF DATA VALUES.

IN GENERAL, A MATRIX DISPLAY WOULD BECOME TOO CLUTTERED IF A SCALE RELATING THE NUMERICAL TABLE CELL WITH THE GRAPHIC ITEM SIZE WERE TO BE USED. INSTEAD, AN ADDITIONAL MATRIX DISPLAY IS PROVIDED WHICH PLOTS THE TABLE IN NUMERICAL FORMAT. FOR MANY CASES, HOWEVER, ESPECIALLY WHEN THE MATRIX HAS ONLY ONE OR A FEW ROWS OR COLUMNS, IT WILL BE PRACTICAL TO ANNOTATE AND EMBELLISH THE DISPLAY WITH SCALE, GRIDS, SHADING, ETC. OTHER GRAPHIC DISPLAYS, SUCH AS LINE GRAPHS AND PIE CHARTS MAY ALSO BE USED.

3.1 HOW IS THE DATA RELATED TO THE VISIBLE DISPLAY?

DATA ANALYSIS BEGINS WITH RAW DATA. THE RAW DATA BOARD MAY BE TRANSFORMED INTO PROFILE DATA BY FIRST DEFINING A STANDARD REFERENCE ROW OR COLUMN AND THEN COMPARING ROWS OR COLUMNS TO IT. THIS PROCESS IS DESCRIBED BELOW. ONLY ONE TABLE, THE RAW BOARD OR THE PROFILE BOARD, IS VISIBLE AT ANY TIME, ALTHOUGH YOU CAN MOVE BACK AND FORTH FREELY ONCE THE PROFILE BOARD HAS BEEN ESTABLISHED. THE RAW BOARD IS ARRANGED AS FOLLOWS.



THE REFERENCES ARE SHOWN AT THE LEFT AND TOP AND ARE SET OFF FROM THE REST OF THE MATRIX, EACH IN A GROUP BY ITSELF. THE REFERENCES MAY BE EITHER UNDEFINED, DEFINED BUT MASKED, OR VISIBLE. WHILE ON THE RAW BOARD, SELECTED ROWS AND COLUMNS MAY BE MASKED, I.E., MOVED OUT-OF-SIGHT BEYOND THE RIGHT OR BOTTOM EDGES OF THE VISIBLE MATRIX, OR RESTORED TO THE VISIBLE MATRIX IN THE ORDER THEY WERE RANKED. THE PROFILE BOARD IS COMPUTED FROM THE VISIBLE MATRIX AND THE REFERENCE, WHETHER VISIBLE OR NOT.

ROWS ARE NUMBERED FROM TOP TO BOTTOM, COLUMNS FROM LEFT TO RIGHT. ONLY THE VISIBLE MATRIX MAY BE REFERRED TO BY ROW AND COLUMN NUMBERS. THE REFERENCES, WHETHER VISIBLE OR NOT, ARE NOT COUNTED.

3.2 DATA SELECTION AND CALIBRATION

IT MAY BE DESIRABLE TO CONSIDER ONLY A PART OF THE RAW DATA AT A TIME OR REPLACE OR INSERT ROWS, COLUMNS OR INDIVIDUAL DATA VALUES. THE **MASK, RESTORE** AND **WINDOW** OPERATIONS HELP SELECT THE DATA OF INTEREST. MASK AND RESTORE HAVE ALREADY BEEN DESCRIBED. **WINDOW** SELECTS A RANGE OF CONSECUTIVE ROWS AND COLUMNS. **REPLACE** AND **INSERT** CAN MODIFY THE DATA VALUES. THIS CAN BE DONE BY ENTERING A LINE OF NUMBERS OR BY FORMING ARITHMETIC EXPRESSIONS TO COMPUTE NEW ROWS AND COLUMNS FROM OLD ONES. THE SECTION BELOW ON ARITHMETIC EXPRESSIONS DESCRIBES THIS IS MORE DETAIL.

EXAMPLE - ENTER THE TABLE - WEATHER BY SEASON (NUMBER OF DAYS)

```
TABLE
SPRING
SUMMER
WINTER
FALL
↑BLANK LINE~
RAINY
51      2       50      70
CLOUDY
10      38      30      11
SUNNY
30      51      11      10
↑BLANK LINE~
```

EXAMPLE - CHANGE 'FALL' TO 'AUTUMN'

```
REPLACE COLUMN 3
AUTUMN
=COLUMN 3
↑BLANK LINE~
```

EXAMPLE - COMBINE CLOUDY AND RAINY

```
REPLACE ROW 1
CLOUDY AND RAINY
=ROW 1 + ROW 2
↑BLANK LINE~
MASK ROW 2
```

3.3 PROCESS OF FORMING PROFILES

RAW DATA VALUES ARE COMPARED ON THE BASIS OF SIZE, WHILE PROFILE DATA COMPENSATES FOR SIZE DIFFERENCES AND ALLOWS ENTIRE ROWS OR COLUMNS TO BE COMPARED WITH EACH OTHER ON THE BASIS OF SHAPE. FOR EXAMPLE, THE TWO ROWS

25	50	25
1	2	1

ARE NOT AT ALL SIMILAR IN TERMS OF RAW DATA VALUES, BUT WHEN CONVERTED TO HORIZONTAL PERCENTAGES THEY ARE IDENTICAL.

THIS IS DONE BY DEFINING A STANDARD REFERENCE ROW OR COLUMN. TYPICALLY, A REFERENCE ROW, FOR EXAMPLE, WOULD BE THE SUM OR AVERAGE OF ALL ROWS IN THE TABLE. IF A SUM, PROFILES ARE FORMED BY TAKING THE PROPORTION OF COLUMN TOTAL FOR EACH RAW DATA VALUE. THIS COMPUTES A NEW TABLE OF PERCENTAGES ON THE PROFILE BOARD. IF AN AVERAGE, THE PROFILE DATA VALUES CAN BE COMPUTED AS THE DIFFERENCE BETWEEN RAW DATA VALUE AND AVERAGE VALUE, WITHIN THE COLUMN, OR THE PERCENT DIFFERENCE FROM AVERAGE. THE REFERENCE MAY ALSO BE DEFINED BY THRESHOLD (A ROW OF CONSTANT VALUE), SELECTING AN ALREADY EXISTING ROW, OR ENTERING A ROW DIRECTLY FROM THE TERMINAL.

EXAMPLE-COMPARE THE DISTRIBUTION OF RAINY CLOUDY AND SUNNY DAYS EACH SEASON WITH THE AVERAGE OVER THE YEAR

REFERENCE COLUMN AVERAGE
PROFILE COLUMN DIFFERENCE

EXAMPLE - WITHIN EACH SEASON, WHAT PERCENT OF THE TIME IS IT RAINY?, CLOUDY?, OR SUNNY?

REFERENCE ROW SUM
PROFILE ROW PROPORTION

EXAMPLE - WHAT IS THE PERCENT CHANGE FROM ONE SEASON TO THE NEXT FOR THE THREE KINDS OF WEATHER?

REFERENCE COLUMN PREVIOUS
PROFILE COLUMN NORMALIZE

3.4 BOARD MANIPULATION

THE FOLLOWING OPERATIONS MAY BE APPLIED

A) PUT CONSECUTIVE ROWS OR COLUMNS INTO GROUPS. ADJACENT ROWS OR COLUMNS WITHIN A GROUP ARE CLOSE TOGETHER. ADJACENT GROUPS ARE SEPARATED.

B) PUT THE ROWS OR COLUMNS IN ANY DESIRED SEQUENCE.

C) SWITCH ANY PAIR OF ROWS OR COLUMNS.

D) RANK ALL ROWS OR COLUMNS ON THE BASIS OF ANY ONE COLUMN OR ROW RESPECTIVELY.

EXAMPLE - ASSOCIATE THE TWO WET SEASONS, FALL AND WINTER, AND THE TWO DRY SEASONS, SPRING AND SUMMER.

```
SEQUENCE COLUMN 3 4 1 2
GROUP COLUMNS 2 2
```

EXAMPLE - RANK THE SEASONS ACCORDING TO NUMBER OF RAINY DAYS (RANK IN ASCENDING ORDER, THEN IN DESCENDING ORDER)

```
RANK ROW 1
RANK ROW 1 DESCENDING
```

4.1 MATRIX DISPLAYS

THE TRANSFORMATION FROM NUMERICAL DATA TO GRAPHIC ITEMS CAN BE DESCRIBED SCHEMATICALLY AS FOLLOWS. ON THE RIGHT ARE SOME OF THE DIRECTIVES WHICH INFLUENCE THE CORRESPONDING PHASE OF THE MAPPING.

```
        DATA ENTRY              TABLE
...     ANALYSIS                RAW, REFERENCE, PROFILE, ETC.
.
.       SCALE THE DATA          BIN, SCALE
.
.       SELECT GRAPHIC          PLOT HORIZONTAL,VERTICAL,CIRCLE,DIGITS
.       VARIABLE
.
.       SCALE GRAPHIC           ENHANCE
.       VARIABLE
.
.....   DISPLAY                 PLOT
```

DATA ENTRY AND ANALYSIS HAVE ALREADY BEEN DESCRIBED.

THE FIRST STEP IN SCALING IS TO BIN THE DATA. THE DATA IS DISTRIBUTED EQUALLY INTO HOWEVER MANY BINS ARE WANTED, FROM 1 TO THE NUMBER OF DISTINCT DATA VALUES. THE AVERAGE VALUE IS TAKEN WITHIN EACH BIN. THIS STEP, WHICH REDUCES DATA RESOLUTION, IS OPTIONAL.

THE SECOND STEP IS TO SCALE ALL POSITIVE NUMBERS TO BETWEEN 0 AND 1 AND ALL NEGATIVE NUMBERS TO BETWEEN 0 AND -1. ONE OF THREE MAPPINGS MAY BE USED TO NORMALIZE THE DATA. ALL THREE PRESERVE SIGN. **RANKING** PRESERVES ONLY THE ORDER OF THE DATA VALUES. **RELATIVE** SCALING PRESERVES THE INTERVALS BETWEEN DATA VALUES AS WELL. RATIOS BETWEEN DATA VALUES ARE IN GENERAL NOT PRESERVED, SINCE THE ZERO VALUE MAY NOT LIE WITHIN THE DATA RANGE. THESE MAPPINGS MAY BE MISLEADING UNLESS CLEARLY UNDERSTOOD, BUT CAN BE USEFUL WHEN EXTREME DATA VALUES ARE PRESENT, OR WHEN 0 WOULD BE AN EXTREME DATA VALUE. THEY HELP USE THE ENTIRE RANGE OF THE GRAPHIC VARIABLE. **ABSOLUTE** SCALING EXTENDS THE DATA RANGE, IF NECESSARY TO INCLUDE ZERO SO THAT RATIOS WILL BE PRESERVED. ABSOLUTE SCALING IS THE DEFAULT.

THE NEXT STEP IS TO SELECT A GRAPHIC VARIABLE. THIS CHOICE IS MADE AUTOMATICALLY, BUT THE USER CAN MAKE ANOTHER ONE. CIRCLES OF VARYING SIZE ARE USED FOR RAW DATA, HORIZONTAL BARS FOR COLUMN PROFILES, AND VERTICAL BARS FOR ROW PROFILES.

A FURTHER TRANSFORMATION MAY BE OPTIONALLY APPLIED TO THE SCALED DATA TO SCALE THE GRAPHICS VARIABLE. THESE TRANSFORMATIONS ARE DESIGNED TO ENHANCE THE LOW, MIDDLE, OR HIGH RANGES OF THE DATA VALUES. ONLY SIGN AND ORDER ARE PRESERVED.

MATRIX DISPLAYS ARE USED BY THE TWO DIRECTIVES RAW AND PROFILE.

4.2 CHART DISPLAYS

CHART DISPLAYS ARE DESIGNED FOR PRESENTATION OF DATA. THEY MAY BE USED EITHER ON THE RAW BOARD OR THE PROFILE BOARD. THE FORMS AVAILABLE ARE BAR CHARTS, PIE CHARTS AND LINE GRAPHS.

THE DEFAULT SCALING USED IS ABSOLUTE, BUT WITH THE DATA RANGE EXTENDED AS NEEDED TO MAKE A LABELED SCALE WITH PLEASING ROUND NUMBERS. RANKING, RELATIVE AND ABSOLUTE SCALING MAY ALSO BE USED, AS WELL AS RELATIVE SCALING WITH USER DEFINED LIMITS. SCALING THE GRAPHIC VARIABLE IS NOT ALLOWED SINCE THIS TRANSFORMATION IS NON LINEAR.

ON LINE GRAPHS, ROWS ARE PLOTTED AS CURVES SUPERIMPOSED ON THE SAME SCALE. LABELED SCALES ARE SHOWN, WITH OPTIONAL GRID LINES, EMPHASIZED GRID LINES, AND DIFFERENT LINE TEXTURES FOR EACH CURVE. THE CURVES MAY BE LABELED, OR A CURVE LEGEND USED INSTEAD.

4.3 TITLES AND LABELS

TITLES AND ROW AND COLUMN LABELS MAY BE USED WITH BOTH CHART AND MATRIX DISPLAYS. UP TO 15 DIFFERENT TITLE LINES MAY BE ENTERED AND DISPLAYED IN ANY COMBINATION AT THE TOP, BOTTOM, LEFT AND RIGHT OF THE SCREEN. THE TITLE LINES MAY BE ENTERED INDIVIDUALLLY OR IN GROUPS, AND THEN POSITIONED INDEPENDENTLY. EACH LINE IS CENTERED OR LEFT JUSTIFIED ON A LINE BY ITSELF.

THE FORMATS FOR ROW AND COLUMN LABELS CAN BE ADJUSTED WITHIN LIMITS. FOR ROW LABELS, AS MUCH HORIZONTAL SPACE - NUMBER OF CHARACTER WIDTHS - CAN BE ALLOCATED AS DESIRED, BUT THE NUMBER OF LINES ALLOCATED TO EACH LABEL IS COMPUTED FROM THE TOTAL VERTICAL SPACE AVAILABLE DIVIDED BY THE NUMBER OF ROWS. SIMILARLY WITH COLUMN LABELS, AS MUCH VERTICAL SPACE - NUMBER OF LINES - CAN BE ALLOCATED AS DESIRED, BUT THE NUMBER OF CHARACTER WIDTHS PER LABEL IS COMPUTED. ROW LABELS MAY BE PLACED AT THE LEFT OR RIGHT, COLUMN LABELS AT THE TOP OR BOTTOM.

EXAMPLE - ALLOT 6 SPACES, THE MINIMUM NEEDED FOR SUMMER AND WINTER, TO ROW LABELS

```
LABEL LEFT 6
```

EXAMPLE - PLACE COLUMN LABELS AT BOTTOM OF PICTURE (ONLY 1 LINE NEEDED)

```
LABEL BOTTOM 1
```

HIERARCHICAL LABELS

DATA TABLES OFTEN MAKE USE OF HIERARCHICAL OR NESTED ROW AND COLUMN LABELS. THE NESTING GRAPHICALLY SHOWS HOW A CATEGORY IS BROKEN DOWN INTO SUBCATEGORIES, AS IN A CROSS TABLUATION, AND CAN BE USED TO EMPHASIZE HOW ADJACENT ROWS AND COLUMNS ARE RELATED -- FOR EXAMPLE COUNTS AND PERCENT OF TOTAL. THE SCOPE OF A COLUMN LABEL IS CONVENTIONALLY SHOWN BY THE NUMBER OF COLUMNS SPANNED AND THE HIERARCHICAL LEVEL BY VERTICAL POSITION: NESTING FOR ROW LABELS IS SHOWN BY INDENTATION. FOR EXAMPLE

	----------INCOME----------			
	RICH		POOR	
	NUMBER	PERCENT	NUMBER	PERCENT
TOTAL	10000	100	4000	100
MALE	2000	20	3000	75
FEMALE	8000	80	1000	25

THIS FORMAT IS GENERATED BY THE PROGRAM FROM THE COMPLETE HIERARCHY CARRIED WITHIN EACH ROW AND COLUMN LABEL. LEVELS ARE

SEPARATED BY ASTERISKS AND MUST BE **IDENTICAL** FROM ONE ROW OR COLUMN TO THE NEXT TO BE RECOGNIZED AS WITHIN THE SAME HIERARCHY. FOR EXAMPLE, THE TABLE ABOVE WAS GENERATED USING THE FOLLOWING LABELS

```
TABLE
----------INCOME----------*RICH*NUMBER
----------INCOME----------*RICH*PERCENT
----------INCOME----------*POOR*NUMBER
----------INCOME----------*POOR*PERCENT
↑BLANK LINE~
TOTAL*
10000 100 4000 75
TOTAL*MALE
2000 20 3000 25
TOTAL*FEMALE
8000 80 1000 25
↑BLANK LINE~
PLOT REPORT
```

UP TO FIVE LEVELS OF NESTING MAY BE USED.

5.1 KEYWORDS AND NUMBERS

THE USER COMMUNICATES WITH THE PROGRAM IN A SORT OF GRUFF PIDGIN ENGLISH. EACH SENTENCE IS ON A SINGLE LINE AND BEGINS WITH A DIRECTIVE - AN IMPERATIVE VERB OR NOUN ACTING AS A VERB - FOLLOWED BY OPTIONAL PARAMETERS AS NEEDED. REASONABLE DEFAULT VALUES ARE TAKEN IF PARAMETERS ARE OMITTED.

SENTENCES CONSIST OF KEYWORDS AND NUMBERS. KEYWORDS ARE FROM ONE TO TEN ALPHABETIC CHARACTERS AND FORM THE VOCABULARY RECOGNIZED BY THE PROGRAM. NUMBERS MAY BE IN FORTRAN INTEGER, FLOATING, OR EXPONENTIAL FORMAT, BUT WITH NO INTERNAL BLANKS. INTERNAL COMMAS ARE IGNORED WITHIN NUMBERS. BOTH KEYWORDS AND NUMBERS SHOULD BE SEPARATED BY ONE OR MORE SPACES. KEY WORDS MAY ALWAYS BE ABBREVIATED TO THE FIRST THREE (3) LETTERS.

DIRECTIVES DESCRIBE
- AN OPERATION TO BE PERFORMED, OR
- A FEATURE TO BE SPECIFIED, OR
- AN OBJECT TO BE CONSTRUCTED OR MANIPULATED.

MOST DIRECTIVES ARE OPERATIONS - SUCH AS PLOT, SCALE, BIN. OTHER DIRECTIVES ARE NAMED AS FEATURES - SUCH AS SHADE, TITLE, LABEL. ANOTHER CLASS IS TYPIFIED BY DIRECTIVES SUCH AS RAW, REFERENCE, BAR, LINE. WHERE THE EMPHASIS IS ON THE NOUN AND THE IMPLIED VERB SUCH AS MAKE, DO, SHOW, ETC. IS OMITTED.

THE SYNTAX IS MINIMAL -
- EACH SENTENCE MUST BE CONTAINED ON A SINGLE LINE
- THE DIRECTIVE IS THE FIRST WORD IN A SENTENCE
- THE PARAMETERS FOR A DIRECTIVE CAN USUALLY BE IN ANY ORDER
- NUMBERS ALWAYS FOLLOW THE KEYWORDS TO WHICH THEY REFER

EXAMPLE

```
GROUP ROWS 3 2
BAR
SCALE FROM 20 TO 50 BY 10
```

HELP(?)

THE QUESTION MARK CHARACTER CAN BE USED ANYWHERE IN A SENTENCE TO ASK WHAT THE PROGRAM IS LOOKING FOR AT THAT POINT, EITHER A NUMBER OR ONE OF A LIST OF KEYWORDS. THIS CAN HELP REFRESH YOUR MEMORY WHEN YOU ALREADY ARE FAMILIAR WITH THE PROGRAM'S CAPABILITIES AND HOW IT IS ORGANIZED, BUT CAN'T REMEMBER A PARTICULAR DIRECTIVE OR OPTION. FOR EXAMPLE, THE PROGRAM TYPES THE COMPLETE LIST OF DIRECTIVES WHEN YOU ENTER A QUESTION MARK AT THE BEGINNING OF A LINE.

5.2 MISSING DATA

TABULAR DATA IN THE REAL WORLD IS OFTEN INCOMPLETE--PARTS OF ROWS AND COLUMNS MAY BE EMPTY BECAUSE NO DATA FOR THESE POSITIONS IS AVAILABLE. THE APPROACH TAKEN WITH THIS PROGRAM IS TO INTERPRET UNREASONABLY LARGE NUMBERS, TEN TO THE TWENTY POWER (1E20 IN FORTRAN EXPONENTIAL FORMAT) OR BIGGER, AS NO DATA-- THESE NUMBERS ARE SIMPLY IGNORED IN ALL CALCULATIONS. IN PARTICULAR, TABLE CELLS CONTAINING THESE MISSING DATA MARKERS ARE UNCHANGED BY ARITHMETIC EXPRESSIONS USED IN REPLACE AND INSERT DIRECTIVES.

THESE NUMBERS MAY BE ENTERED BY THE USER, OR COMPUTED BY THE PROGRAM. FOR EXAMPLE THE CALCULATION ROW1/ROW2 WILL RESULT IN NO DATA FOR THOSE POSITIONS WHERE ROW2 HAS ZEROES. MISSING DATA IS NORMALLY SHOWN BY PLOTTING 'N/A' IN THE CORRESPONDING TABLE CELL. WHERE MORE DESCRIPTIVE LABELS ARE NEEDED, THE FOLLOWING TRICK CAN BE USED.

NUMBERS IN THE RANGE 1E50 TO 15E50 ARE KEYED TO TITLE LINES 1 THROUGH 15. THE FIRST CHARACTER OF THE CORRESPONDING TITLE LINE IS USED TO MARK 'NO DATA' FOR THE TABLE CELL. FOR EXAMPLE, YOU COULD FOOTNOTE MISSING DATA (SAY 5E50) WITH ASTERISKS AS FOLLOWS

```
TITLE 5
* NO DATA AVAILABLE
TITLE BOTTOM 5
```

NOMINAL DATA CAN ALSO BE HANDLES BY THIS TECHNIQUE IN A LIMITED WAY. BY DEFAULT, ONLY THE FIRST CHARACTER OF THE TITLE LINE IS PLOTTED IN THE TABLE CELL. THE **LABEL NOMINAL ↑N~** DIRECTIVE (Q.V.) SHOWS THE FIRST N CHARACTERS INSTEAD.

5.3 ARITHMETIC EXPRESSIONS

ARITHMETIC EXPRESSIONS MAY BE USED TO COMPUTE AN ENTIRE ROW OR COLUMN. THEY ARE ACCEPTED AS PARAMETERS TO THE **TABLE**, **REPLACE** AND **INSERT** DIRECTIVES. THEY MUST BEGIN WITH AN = SIGN AND BE CONTAINED ON A SINGLE LINE. ARITHMETIC EXPRESSIONS CONSIST OF CONSTANTS (FORTAN INTEGER, FLOATING OR EXPONENTIAL FORMAT NUMBERS), ROW AND COLUMN NUMBERS, AND THE ARITHMETIC OPERATORS + - * / _ . SUBEXPRESSIONS MAY BE PARENTHESIZED AND SPACES MAY BE USED AS SEPARATORS. ROW AND COLUMN NUMBERS ARE PRECEDED BY THE KEYWORDS **ROW** AND **COLUMN**. ARITHMETIC EXPRESSIONS ARE EVALUATED ELEMENT BY ELEMENT FOR AN ENTIRE ROW OR COLUMN VECTOR.

EXAMPLE - COMPUTE THE AVERAGE OF EACH COLUMN IN ROWS 1 AND 2

```
REPLACE ROW 3
↑LABEL FOR ROW 3~
=(ROW1+ROW2)/2
```

```
EXAMPLE - SET EVERY ELEMENT IN COLUMN 4 TO 999.9
REPLACE COLUMN 4
↑LABEL FOR COLUMN 4~
=999.9
```

EXAMPLE - CHANGE LABEL FOR COLUMN 6

```
REPLACE COLUMN 6
↑NEW LABEL FOR COLUMN 6~
=COLUMN 6
```

A COLUMN NUMBER EXPRESSION IS PERMITTED WHEN A ROW IS BEING ENTERED, AND IS INTERPRETED AS FOLLOWS. THIS IS CONSIDERED TO BE A ROW OF ALL ZEROES EXCEPT FOR A ONE IN THE CORRESPONDING COLUMN NUMBER POSITION. SIMILARLY, WHEN ENTERING COLUMNS A ROW NUMBER EXPRESSION IS CONSIDERED TO BE A COLUMN OF ALL ZEROES EXCEPT FOR A ONE IN THE CORRESONDING ROW NUMBER POSITION.

EXAMPLE - ADD 100 TO COLUMN 6 IN ROW 3

```
REPLACE ROW 3
↑LABEL FOR ROW 3~
=ROW3+100*COLUMN6
```

EXAMPLE - WITHIN ROW 3
MULTIPLY COL 1 BY 1, COL 2 BY 2 AND COL 3 BY 3

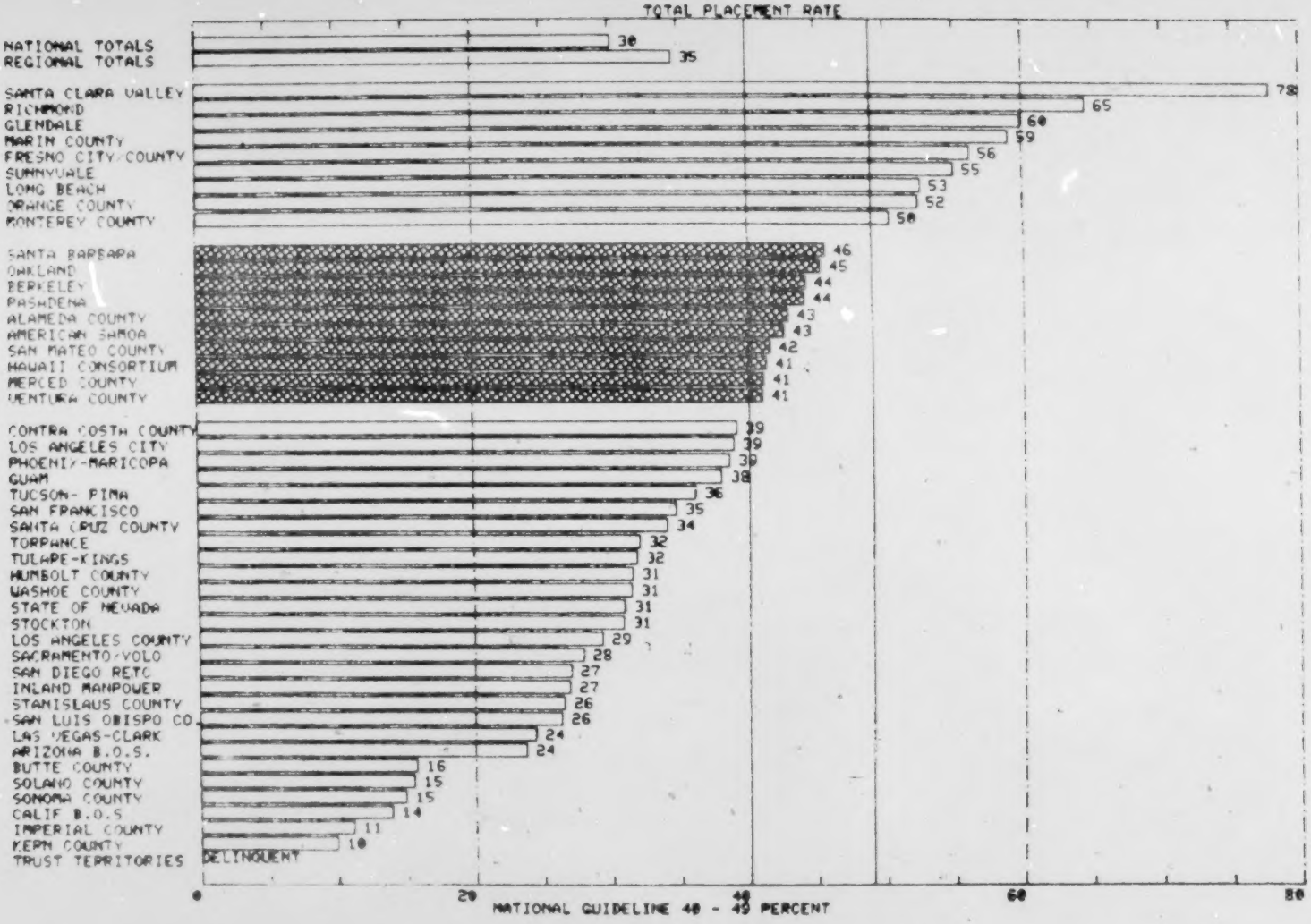
```
REPLACE ROW 3
↑LABEL FOR ROW 3~
=ROW3*(COL1+2*COL2+3*COL3+ COL4+ ...)
```

**********END OF EXCERPT**********

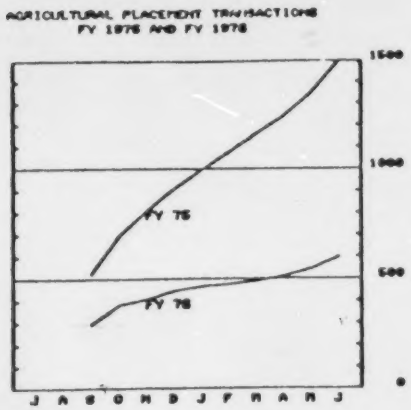
APPENDIX D:

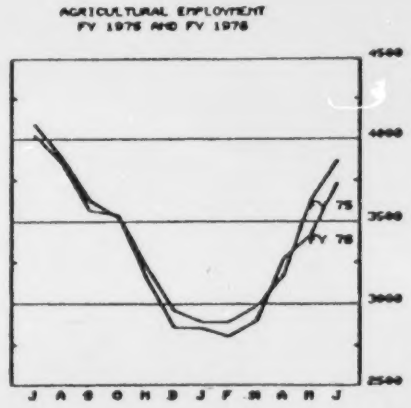
SAMPLE REPORTS
(VIA THE INTERACTIVE TOOLS)

CETA TITLE 1
SELECTED INDICATORS
FISCAL YEAR 1976 THROUGH SEPTEMBER 1976



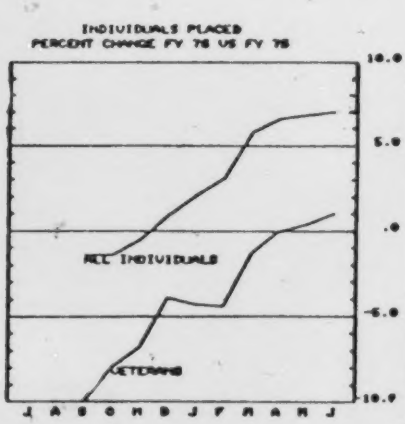
It is suspected that this drop is due to a change in SESA emphasis to the longer term nonagricultural jobs (California closed eight agricultural day-haul centers in FY '76) and to the effects of the Richey Court Order on increased enforcement of the work condition standards for agricultural employees placed through ES.

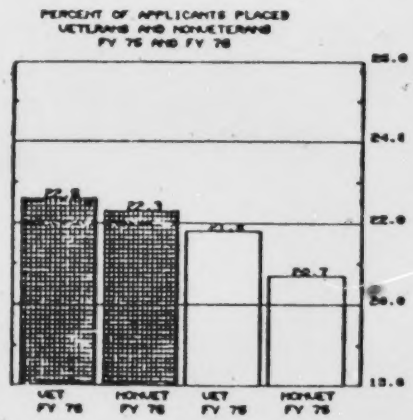


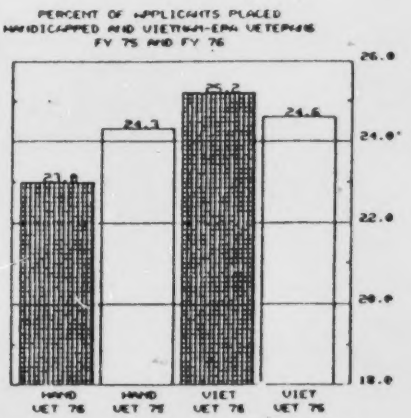


* Veterans

The veteran placement record has improved markedly during the last quarter. For the first three quarters veterans placed was behind FY '75; for the whole year it posted a 1% rise. This is below the 7% rise posted for all applicants, and although veterans are receiving a slight preference, the preference has deteriorated since FY '75.





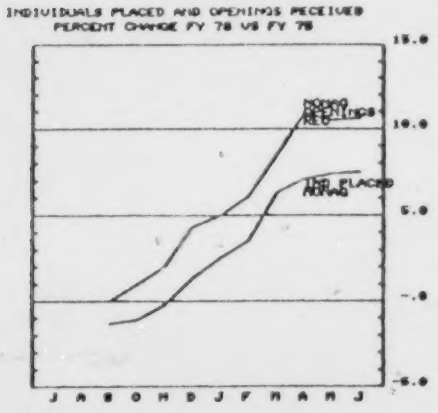


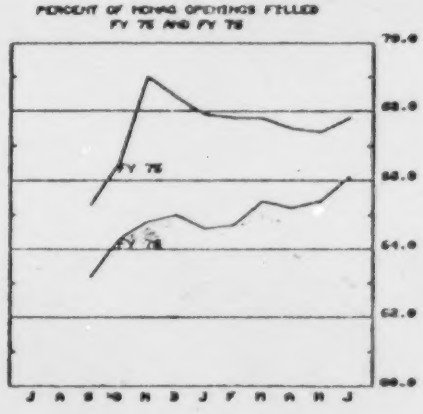
Vietnam-era veterans placed posted a 3% gain, but did not match the 7% rise posted by all applicants. Handicapped veterans placed was slightly ahead of FY '75 with a 1% gain. The percentage of Vietnams-era veteran applicants did increase slightly, but the percentage of handicapped veterans placed fell from 24% to 23%.

All categories of veterans increased in individuals counseled, while all applicants posted a decline.

* Nonagricultural Openings

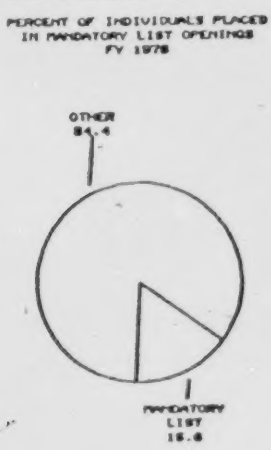
Nonagricultural openings received rose 11% over FY '75; however, the fill rate fell from 68% to 66%.

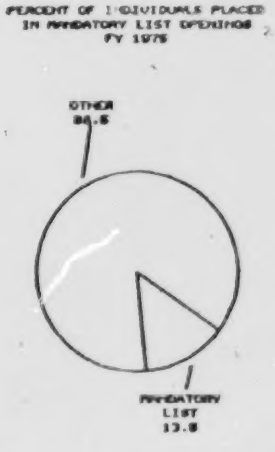




* Mandatory Listing

The mandatory listing program made strong gains during the recovery. Openings received were up 17% and individuals placed in mandatory openings rose 20% over FY '75. Individuals placed under the program accounted for 16% of all individuals placed in FY '76 versus 14% in FY '75.





WORK INCENTIVE PROGRAM
MANDATORY VS. VOLUNTARY
JULY 1975 THROUGH JUNE 1976

	VOLUNTARY REGISTRANTS	MANDATORY REGISTRANTS	
		NUMBER	PERCENT
ARIZONA	4210	5544	57
CALIFORNIA	18453	258783	93
HAWAII	1327	7837	86
NEVADA	1154	1984	63
REGION I	18447	92898	83
REGION II	40532	229079	85
REGION III	34012	158058	82
REGION IV	99000	182643	65
REGION V	90727	341457	79
REGION VI	37509	60726	62
REGION VII	27840	51261	65
REGION VIII	10319	36615	78
REGION IX	25144	274148	92
REGION X	14947	60680	80
NATION	398477	1487560	79

READY

AT YOUR COMMAND.

PRINT LINE
ENTER TABLE(S) FOLLOWED BY LINE(S) IN PARENTHESES
(EXAMPLE - '891(46)(35-36),22' SPECIFIES LINES 46 FOLLOWED BY 35
THROUGH 36 FROM TABLE 891 FOLLOWED BY ALL LINES FROM TABLE 22)
22(200-210)

(REPORT ID = CA,DEC,1975,STATEWIDE)

TABLE 22 (SYGRANT ACTIVITY)
ACTIVITY RELATED TO THE PLAN OF SERVICE AND BALANCED PLACEMENT FORMULA

ITEM NO	ACTIVITY	TOTAL	FEMALE	MINORITY	ECONOMICALLY DISADVANTAGED	RURAL
A	B	C	D	J	K	L
	TRANSACTIONS					
22200	TOTAL PLACEMENTS	206658	0	0	0	0
22202	PLACEMENTS					
22209	(EXCLUDING MASS)	22[illegible]720	80040	161733	73891	29404
22210	NONAGRICULTURAL	199084	73506	85410	64501	18434

ITEM NO	AGE		VETERAN		MIGRANT	HANDICAPPED	OTHER DISADVANTAGED
	UNDER 22	45 AND OVER	TOTAL	VIETNAM ERA HANDICAPPED			
-	F	G	H	I	M	N	O
	TRANSACTIONS						
200	0	0	0	0	0	0	0
205	87461	30693	471[illegible]0	27885	4197	4055	7924	31440
210	73635	20203	45247	25[illegible]11	3952	748	7361	31104

(FREQ = 1, TIMER = 7)

```
(YOU MAY ENTER A LINE NUMBER OR RANGE OF LINE NUMBERS IN PARENTHESES)
GET REPORT 6-12-5
WILL ATTEMPT RETRIEVAL OF THE REPORT FOR  CA, DEC, 1975, STATEWIDE...
REPORT RETRIEVED...
AT YOUR COMMAND.=
PR HDR 316
HDR  316 ONLY EXISTS IN REPORTS BEFORE JUL79
AT YOUR COMMAND.=
PR HDR 318
HDR  318 IS IN THE FOLLOWING TABLE(S) FOR THE DATE OF THIS REPORT...
  96 - APPLICANTS AND NONAGRICULTURAL JOB OPENINGS BY OCCUPATION
WANT DATA FROM TABLE  96?
(YOU MAY ENTER A LINE NUMBER OR RANGE OF LINE NUMBERS IN PARENTHESES)
(0-002)



(REPORT ID = CA,DEC,1975,STATEWIDE)

TABLE  96
APPLICANTS AND NONAGRICULTURAL JOB OPENINGS BY OCCUPATION
-------------------------------------------------------------------------
 ITEM .  OCCUPATIONAL CODE  . NONAGRICULTURAL OPENINGS
  NO  .                     .  UNFILLED OPEN
      .                     .   30 DAYS OR MORE
-------------------------------------------------------------------------
  A   .          B          .     C     .
 96   .TOTAL     .          .  10379.
 96   ...01      .          .      4.
 96   ...01031   .          .      2.
 96   ...01031010.          .      0.
 96   ...01231   .          .      2.
 96   ...OOC     ...........     13.

(FROM = 3, TIMPER = 7)


HDR  318 IS IN THE FOLLOWING TABLE(S) FOR THE DATE OF THIS REPORT...
  96 - APPLICANTS AND NONAGRICULTURAL JOB OPENINGS BY OCCUPATION
WANT DATA FROM TABLE  96?
(YOU MAY ENTER A LINE NUMBER OR RANGE OF LINE NUMBERS IN PARENTHESES)
```

SWITCH SET

WORK INCENTIVE PROGRAM
COST ANALYSIS
FISCAL YEAR CUMULATIVE THROUGH JUNE, 1976

	COST PER OJT ENTERED EMPLOYMENT		
	OJT COSTS	OJT ENTERED EMPLOYMENT	COST PER
ARIZONA	406734	72	5649
CALIFORNIA	11527508	1376	8378
HAWAII	250825	63	3981
NEVADA	102522	34	3015
REGION IX	12287589	1545	7953

READY

WORK INCENTIVE PROGRAM

JUNE, 1976

	INDIVIDUALS		INDIVIDUALS ENTERED EMPLOYMENT AS A PERCENT OF REGISTRANTS
	REGISTERED	ENTERED EMPLOYMENT	
ARIZONA	10178	1153	11.3
CALIFORNIA	355214	33821	9.5
HAWAII	9438	1173	12.4
NEVADA	3771	634	16.8
REGION I	141579	11739	8.3
REGION II	279868	15173	5.4
REGION III	207762	18253	8.8
REGION IV	305362	20791	6.8
REGION V	468661	42365	9.0
REGION VI	102512	12232	11.9
REGION VII	96277	8581	8.9
REGION VIII	55398	9562	17.3
REGION IX	378601	36781	9.7
REGION X	81734	10585	13.0
NATION	2117750	186062	8.8

TABLE 1
JOB SERVICE
OREGON MARCH 1976
VETERANS PERCENT PREFERENCE INDICATORS

	VETERANS		NON-VETERANS[1]		VETERANS PERCENT PREFERENCE
	SERVED	PERCENT	SERVED	PERCENT	
TOTAL VETERANS					
COUNSELING	5278	11.38	5290	9.19	28.31
ENROLLMENTS IN TRAINING	271	.61	473	.82	-26.26
JOB DEVELOPMENT CONTACTS	2433	5.44	1992	3.46	57.04
REFERRED TO JOBS	24425	54.59	26977	46.89	16.43
INDIVIDUALS PLACED	11157	24.94	13141	22.84	9.18
INACTIVATED WITH SOME SERVICE	18557	41.47	22340	38.83	6.82
NEW AND RENEWALS	44743		57537		
RECENTLY SEPARATED VETERANS					
COUNSELING	2379	12.50	5290	9.19	35.98
ENROLLMENTS IN TRAINING	127	.69	473	.82	-15.77
JOB DEVELOPMENT CONTACTS	1553	5.75	1992	3.46	65.93
REFERRED TO JOBS	15347	56.78	26977	46.89	21.10
INDIVIDUALS PLACED	7080	26.19	13141	22.84	14.69
INACTIVATED WITH SOME SERVICE	11706	43.31	22340	38.83	11.54
NEW AND RENEWALS	27029		57537		
DISABLED VETERANS					
COUNSELING	345	15.11	5290	9.19	64.30
ENROLLMENTS IN TRAINING	14	.61	473	.82	-25.37
JOB DEVELOPMENT CONTACTS	151	6.61	1992	3.46	90.93
REFERRED TO JOBS	1179	51.62	26977	46.89	10.10
INDIVIDUALS PLACED	500	21.89	13141	22.84	-4.15
INACTIVATED WITH SOME SERVICE	920	40.28	22340	38.83	3.74
NEW AND RENEWALS	2284		57537		

[1]EXCLUDES YOUTH (LESS THAN 20) AND FEMALES

CALIFORNIA
TABLE A--FY 76 REVIEW OF MIGRANTS AND SEASONAL FARMWORKERS
JULY 1975 THROUGH SEPTEMBER 1976

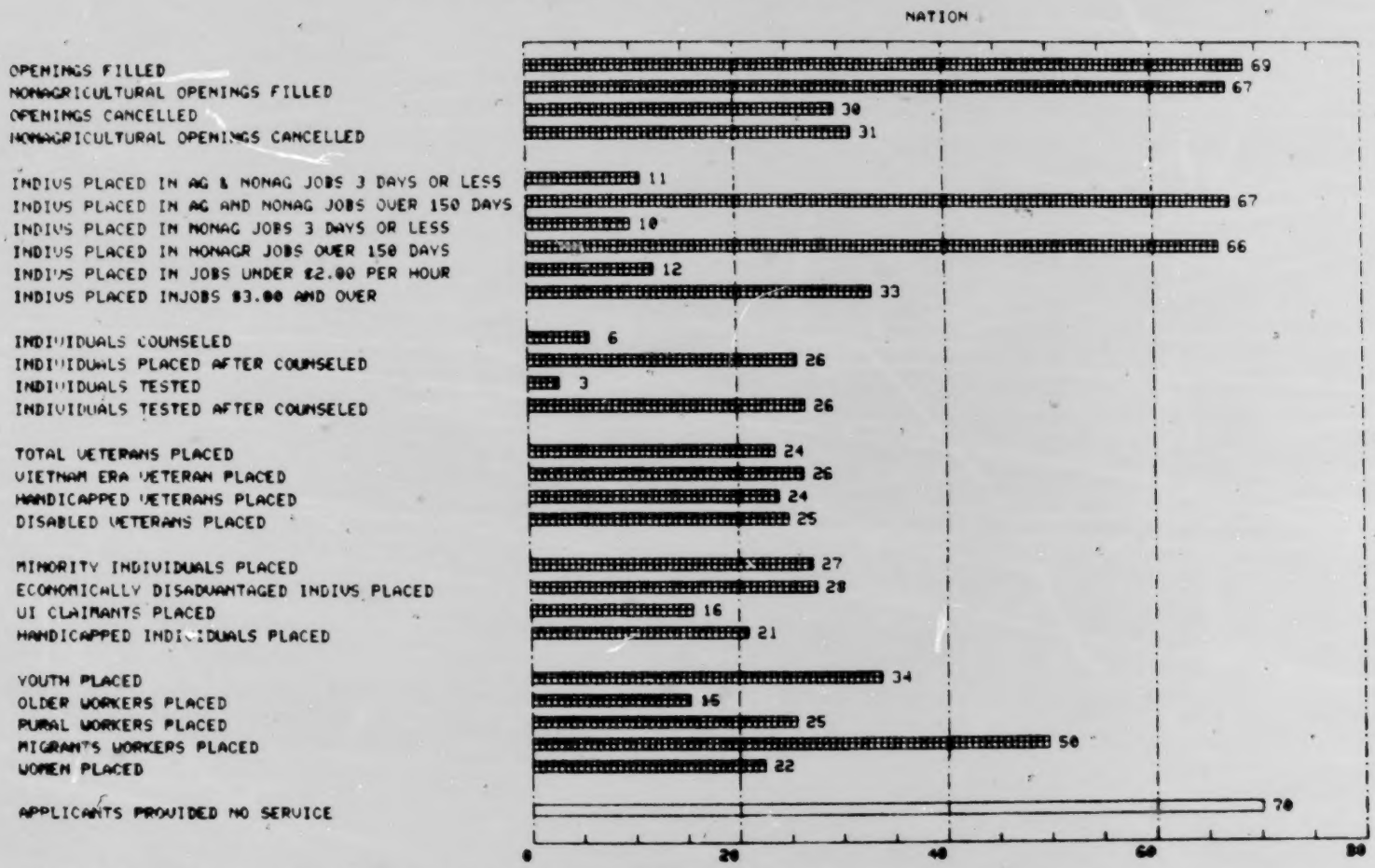
	MIGRANT AND SEASONAL FARMWORKERS(MSFW)		ALL NON MSFW APPLICANTS	
	NUMBER	PERCENT	NUMBER	PERCENT
PERCENT OF ALL		2.9		97.1
1.APPLIC.AVAIL.	68657	100.0	2031830	100.0
1A.COMPLETE APPS.	45543	75.1	1693250	83.3
1B.PARTIAL APPS.	15115	24.9	338584	16.7
2.REFERRED TO JOB	26940	44.4	821652	40.4
2A.AGRICULTURE	20563	33.9	42978	2.1
2B.NON-AGRICULTURE	9101	15.0	800171	39.4
3.PLACED IN JOB	22190	36.6	408702	20.1
3A.AGRICULTURE	18015	29.7	27697	1.4
3B.NON-AGRICULTURE	5633	9.3	388729	19.1
4.ENROLL IN TRAIN	367	.8	18177	1.1
5.COUNSELED	676	1.5	46709	2.8
6.JOB DEVEL. CONTACTS	2628	5.8	66823	3.9
7.TESTED	217	.5	21297	1.3
8.REFER TO SUPP.SERV.	1628	3.6	35166	2.1
9.REC'D.SOME SERV.	33625	55.4	997802	49.1
10. INDIV. PLACED				
10A. LONG TERM NON-AG	2071	3.4	239308	11.8
10B. 1-3 DAY JOBS	5469	9.0	70823	3.5
10C. $3 OR MORE/HR	5535	9.1	180403	8.9
10D.$2.10 OR LESS/HR	1086	1.8	43345	2.1

PERCENTAGES ARE BASED ON APPLICANTS AVAILABLE EXCEPT FOR--

ENROLLED IN TRAINING(4),COUNSELED(5),JOB DEVELOPMENT CONTACTS(6),TESTED(7) AND REFERRED TO SUPPORTIVE SERVICES(8). THE PERCENTAGES FOR THESE ITEMS ARE BASED ON THE NUMBER OF COMPLETE APPLICATIONS (FULLY REGISTERED APPLICANTS).

US DEPARTMENT OF LABOR
EMPLOYMENT AND TRAINING ADMINISTRATION
MANAGEMENT DATA SYSTEMS AND ANALYSIS

EMPLOYMENT SERVICE PERFORMANCE INDICATORS
5TH QUARTER FY '76, SEPTEMBER 1976


NATION
OPENINGS FILLED 69
NONAGRICULTURAL OPENINGS FILLED 67
OPENINGS CANCELLED 30
NONAGRICULTURAL OPENINGS CANCELLED 31
INDIVS PLACED IN AG & NONAG JOBS 3 DAYS OR LESS 11
INDIVS PLACED IN AG AND NONAG JOBS OVER 150 DAYS 67
INDIVS PLACED IN NONAG JOBS 3 DAYS OR LESS 10
INDIVS PLACED IN NONAGR JOBS OVER 150 DAYS 66
INDIVS PLACED IN JOBS UNDER $2.00 PER HOUR 12
INDIVS PLACED INJOBS $3.00 AND OVER 33
INDIVIDUALS COUNSELED 6
INDIVIDUALS PLACED AFTER COUNSELED 26
INDIVIDUALS TESTED 3
INDIVIDUALS TESTED AFTER COUNSELED 26
TOTAL VETERANS PLACED 24
VIETNAM ERA VETERAN PLACED 26
HANDICAPPED VETERANS PLACED 24
DISABLED VETERANS PLACED 25
MINORITY INDIVIDUALS PLACED 27
ECONOMICALLY DISADVANTAGED INDIVS PLACED 28
UI CLAIMANTS PLACED 16
HANDICAPPED INDIVIDUALS PLACED 21
YOUTH PLACED 34
OLDER WORKERS PLACED 16
RURAL WORKERS PLACED 25
MIGRANTS WORKERS PLACED 50
WOMEN PLACED 22
APPLICANTS PROVIDED NO SERVICE 70
0
20
40
60
80

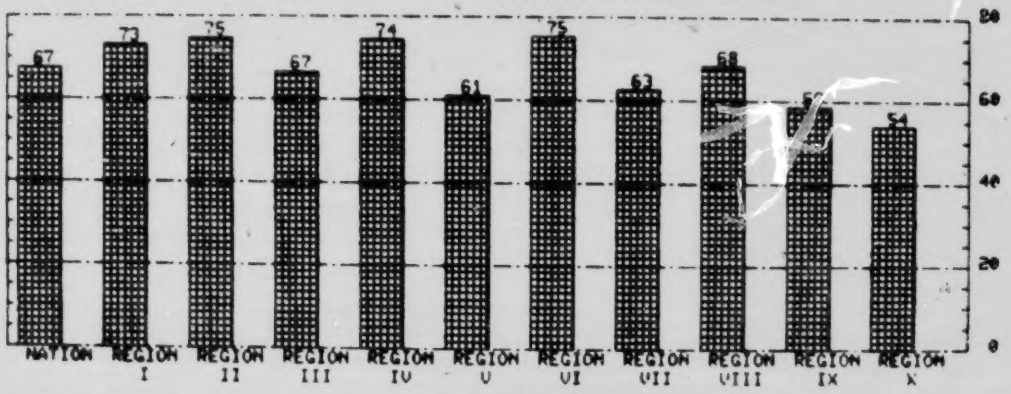
SOURCE--NATIONAL OFFICE, USES, EMPLOYMENT SERVICE PERFORMANCE INDICATORS
ACTIVITY REFLECTS ALL SOURCES OF FUNDS

10

US DEPARTMENT OF LABOR
EMPLOYMENT AND TRAINING ADMINISTRATION
MANAGEMENT DATA SYSTEMS AND ANALYSIS

EMPLOYMENT SERVICE PERFORMANCE INDICATORS
5TH QUARTER FY '76, SEPTEMBER 1976

INDIVIDUALS PLACED IN AG AND NONAG JOBS OVER 150 DAYS



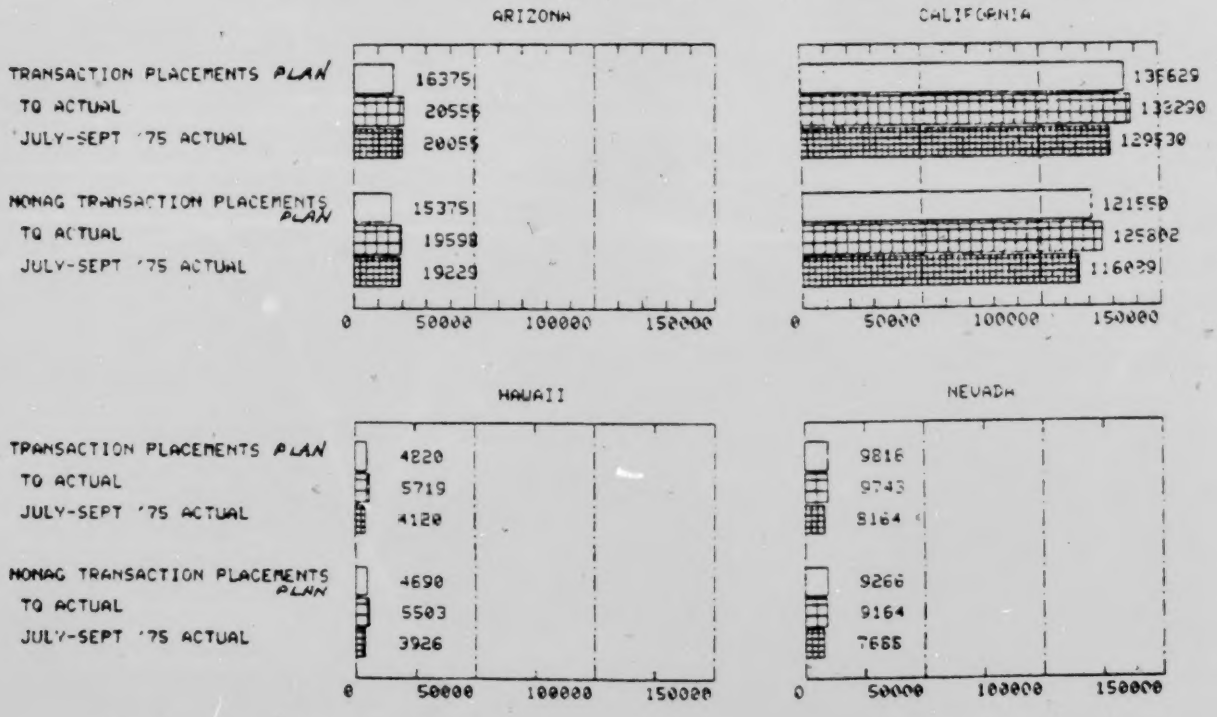
SOURCE--NATIONAL OFFICE, USES, EMPLOYMENT SERVICE PERFORMANCE INDICATORS
ACTIVITY REFLECTS ALL SOURCES OF FUNDS

EMPLOYMENT SERVICE
TRANSITIONAL QUARTER PERFORMANCE REVIEW

Transitional quarter activity can be viewed from two perspectives--as a discrete ninety-day performance period (July 1976 - September 1976), and as an influencing "fifth quarter" of a fifteen-month fiscal year.

July 1976 - September 1976

Because of eccentricities in the reporting system, placement goals for the transitional quarter were expressed in terms of transactions rather than individuals. The Region IX SESAs proved accurate--if not somewhat conservative--prophets: 105% of the aggregated placement transaction plan was met, with all the target group goals met or exceeded. Each agency also surpassed its FY '75 accomplishment for the comparable period:

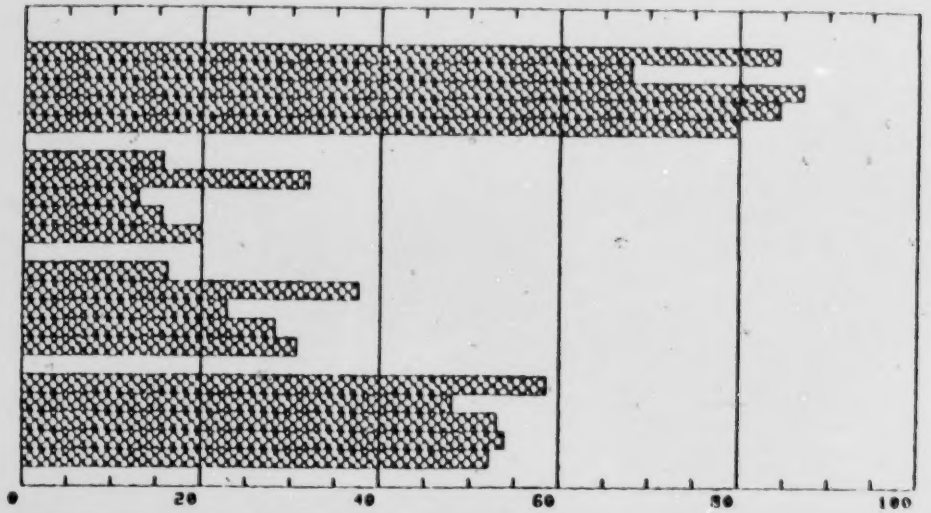


PLACEMENT TRANSACTIONS

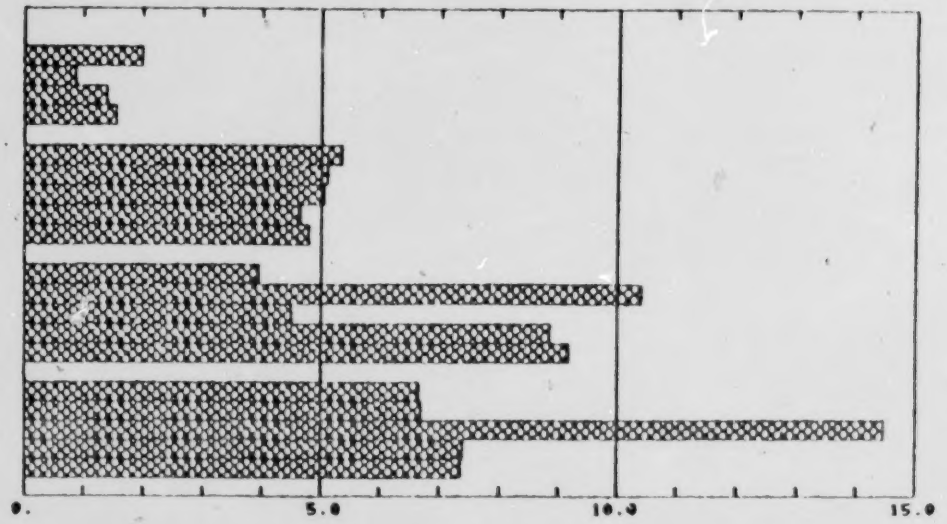
	Percentage of Plan Accomplished	Percent Change From July-Sept. '75
Arizona	126%	+2%
California	102%	+7%
Hawaii	119%	+39%
Nevada	99%	+19%

INDICATORS OF COMPLIANCE REPORT
SERVICES TO MIGRANT AND SEASONAL FARMWORKERS
(PERCENT) CALIFORNIA - MARCH 1976

COMPLETE APPLICATIONS
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
PARTIAL APPLICATIONS
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
INDIVIDUAL PLACEMENTS
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
NO SERVICE
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS



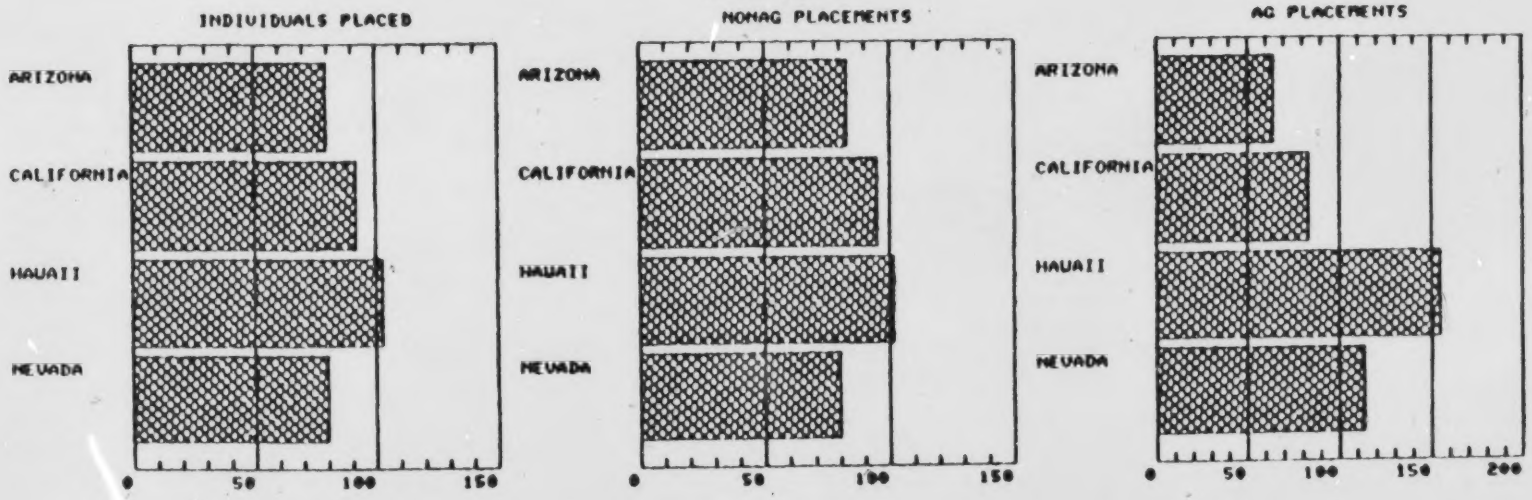
UNDER $2.10
ALL APPLICANTS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
$2.10 TO 2.49
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
$2.50-2.99
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS
OVER $3.00
ALL APPLICANTS
MIGRANT FARMWORKERS
MIGRANT FOOD PROCESSING WORKERS
SEASONAL NON-MIGRANT FARMWORKERS
MIGRANT AND SEASONAL FARMWORKERS



OPCS INDICATORS
ACTUAL ACCOMPLISHMENT VS. PLAN
MARCH 1976

	ARIZONA	CALIFORNIA	HAWAII	NEVADA
INDIVIDUALS PLACED (PLAN)	45200	231405	12134	14057
INDIVIDUALS PLACED (ACTUAL)	36025	213163	12476	11259
PERCENT OF PLAN ACCOMPLISHED	80	92	103	80
NONAG PLACEMENTS (PLAN)	41250	203243	11764	13393
NONAG PLACEMENTS (ACTUAL)	34145	193357	11968	10740
PERCENT OF PLAN ACCOMPLISHED	83	95	102	80
AG PLACEMENTS (PLAN)	3950	28252	370	696
AG PLACEMENTS (ACTUAL)	2539	23492	573	790
PERCENT OF PLAN ACCOMPLISHED	64	83	155	113

OPCS INDICATORS
PERCENT OF PLAN ACCOMPLISHED
MARCH 1976



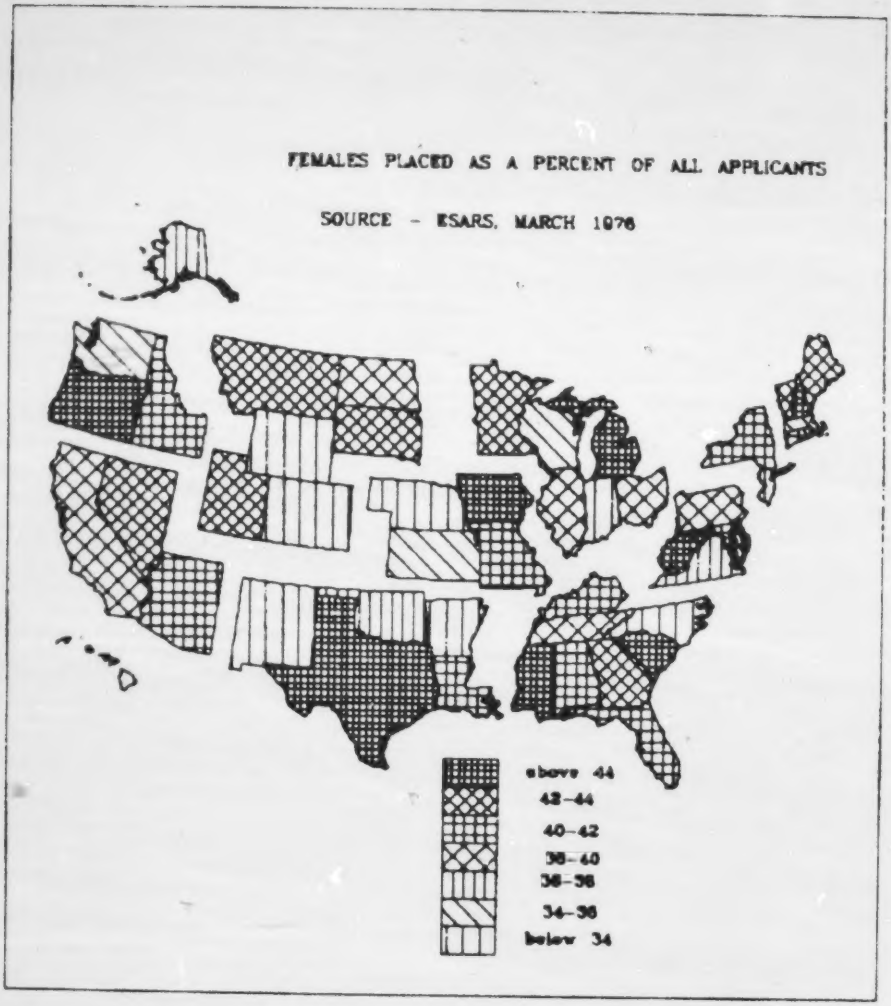
INDICATORS OF COMPLIANCE REPORT
SERVICES TO SEASONAL FARMWORKERS AND MIGRANT WORKERS
CALIFORNIA - MARCH 1978

	MIGRANT FARMWORKERS	PERCENT	MIGRANT FOOD PROCESSING WORKERS	PERCENT	SEASONAL NONMIGRANT FARMWORKERS	PERCENT	MIGRANT AND SEASONAL FARMWORKERS	PERCENT	ALL APPLICANTS	PERCENT
APPLICANTS AVAILABLE	10808	100	918	100	26985	100	38703	100	1551010	100
COMPLETE APPLICATIONS	7351	68	784	87	22802	84	30047	80	1309001	84
PARTIAL APPLICATIONS	3456	32	118	13	4183	15	7756	20	242009	16
AGRICULTURAL REFERRALS	3739	35	51	6	6043	22	9833	25	34835	2
NONAGRICULTURAL REFERRALS	1121	10	283	29	3022	11	4406	11	491861	32
INDIVIDUAL PLACEMENTS	4063	38	208	23	7597	28	11868	31	252036	16
AGRICULTURAL	3558	33	46	5	5869	22	9471	24	27204	2
AGRICULTURAL (OVER 150)	276	3	4	0	677	3	957	2	4679	0
NONAGRICULTURAL	697	6	172	19	2198	8	3067	8	229514	15
NONAGRICULTURAL (OVER 150)	206	2	50	5	662	2	918	2	141063	9
UNDER 2.10	214	2	8	1	376	1	698	2	31825	2
$2.10-2.29	298	3	32	4	687	3	1009	3	61021	4
$2.30-2.49	263	2	14	2	566	2	843	2	22076	1
$2.50-2.99	1119	10	41	5	2388	9	3548	9	61047	4
$3.00-3.49	431	4	21	2	952	4	1404	4	42318	3
$3.50-3.99	169	2	79	9	676	3	924	2	26605	2
$4.00-4.49	90	1	27	3	279	1	396	1	17239	1
$4.50-4.99	6	0	2	0	32	0	48	0	5157	0
$5.00 AND OVER	29	0	3	0	63	0	85	0	11960	1
JOB DEVELOPMENT CONTACTS	838	8	17	2	682	3	1337	3	40646	3
ENROLLED IN TRAINING	36	0	3	0	168	1	204	1	11256	1
COUNSELED	52	0	18	2	308	1	379	1	30199	2
TESTED	22	0	5	1	187	0	134	0	13500	1
REFERRED TO SUPPORT SERVICE	134	1	11	1	534	2	679	2	10859	1
NO SERVICE	5187	48	482	53	14513	54	20182	52	907250	58

```
WELCOME TO THE LBL
 - - S - E - E - D - -
SOCIO-ECONOMIC-ENVIRONMENTAL-DEMOGRAPHIC
INFORMATION SYSTEM RETRIEVAL PROGRAM
ACCESS TO THIS FILE IS RESTRICTED TO AUTHORIZED PERSONS
ENTER PASSWORD
[redacted]
ENTER 2 DIGIT FIPS STATE CODE
04!
 FILE=04-ARIZONA                    ES202 DATA FOR 4TH QUARTER 1974
ENTER FIPS COUNTY CODE OR ABBREVIATED COUNTY NAME
NAVAJO!
DEFINE STUDY AREA
NEW OR OLD?
NEW!
ENTER STUDY AREA NAME
TEST!
ENTER 2 DIGIT 1967 SIC CODES
07,10,52,89;!
DISPLAY?
FIPS.CTY,SIC.67.4D,UI.NO,EMP.1,EMP.2,EMP.3;!
.
.
.
```

FIPS CNTY CODE	1967 4DIG SIC	STATE UI NUMBER	EMPLMNT MONTH 1	EMPLMNT MONTH 2	EMPLMNT MONTH 3
017	072	66715	2	2	2
017	073	78254	3	2	2
017	108	53553	5	5	5
017	521	02383	8	8	8
017	521	22747	23	19	25
017	521	24455	30	20	15
017	521	33118	0	0	0
017	522	74629	2	3	3
017	522	76382	1	1	1
017	525	63675	1	1	1
017	525	65145	5	5	4
017	525	80994	8	8	8
017	525	83376	11	11	12
017	891	30244	0	0	0
017	891	33286	6	6	6
017	891	51059	0	0	0
017	893	28612	2	2	2
017	893	40392	2	2	2
017	893	61345	1	1	1
017	893	64679	2	1	1
017	893	66788	5	5	5
017	893	72617	4	4	4
TOTALS			121	106	107

```
MORE QUERIES ON SAME STUDY AREA?
NO!
ENTER 2 DIGIT FIPS STATE CODE
```


FEMALES PLACED AS A PERCENT OF ALL APPLICANTS
SOURCE - ESARS, MARCH 1976
above 44
42-44
40-42
38-40
36-38
34-36
below 34

APPENDIX E:

HUB WRITEUP
(DATA INTEGRATION)

(UCID - 3870)

```
H     H  U     U  BBBBBB
H     H  U     U  B     B
H     H  U     U  B     B
HHHHHHH  U     U  BBBBBB
H     H  U     U  B     B
H     H  U     U  B     B
H     H   UUUUU   BBBBBB
```

(A LBL SEEDIS INTERACTIVE SUBSYSTEM)

\+ (VERSION 2 - 14OCT76)
(VEPSION 1 - 08SEP76)

\+ The character + is used to indicate <u>significant</u> changes since the last version of this document.

Comments may be addressed to

\+ Bradford Heckman
\+ Room 3211a, Building 50B
\+ Lawrence Berkeley Laboratory
\+ University of California
\+ Berkeley, California 94720
\+ (415) 843-2740 x6068

or Peter Kreps
Room 2239, Building 50B
Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720
(415) 843-2740 x5830

(This writeup is in PSS library HUB, subset WRITEUP.)

TABLE OF CONTENTS 18 JAN 77

1. INTRODUCTION 1

2. + HUB SYNTAX 2

3. + HOW HUB WORKS 4

4. + SUBSYSTEM STANDARDS FOR THE USE OF HUB 8

Design of the SEEDIS interactive subsystem "HUB" was begun in September, 1976, after it became apparent through user feedback that SESAME was too difficult for noncomputer oriented users to use. Goals of the design include

the inclusion of the RGNLMIS design features to allow ease of use (see UDID-3814, available in ASCII BARB output from PSS library RGNLMIS, subset DCMNTN),

immediate and reliable startup of all other SEEDIS interactive subsystems regardless of which storage devices happen to be nonoperational (via the SEEDIS subsystem called INTERAC),

the ability to transfer between subsystems in any order and

production of a BARBED record session of user entries and computer responses for all subsystems used.

```
ENTERING HUB...
*IF THE INTERAC INDEX FOR HUB MUST BE OBTAINED FROM TAPE (AS
*EXPLAINED BELOW) THE FOLLOWING MESSAGE WILL BE GIVEN AT THIS
*POINT...
THE COMPUTER OPERATORS MUST GET A MAGNETIC TAPE...
ESTIMATED WAIT WILL BE 1-5 MINUTES (19.21.05)
************************************************

YOU HAVE ENTERED "HUB"     (A SEEDIS SUBSYSTEM)...
THE PRESENT VERSION IS 1A (EFFECTIVE **SEP76)

THE PRESENT DATE IS WEDNESDAY, 01 SEP 76
THE PRESENT TIME IS 19.25.33 (IN BERKELEY)

+   YOU MAY ENTER THE CHARACTER ? FOR A LIST OF COMMANDS...
    (ALL YOUR LINES SHOULD END BY DEPRESSING THE CARRIAGE RETURN KEY)
    HUB IS AT YOUR COMMAND.
    ?
    HELP        (ME, I'M A NEW USER)
    ----        (DASHES INDICATE THE MINIMUM CHARS WHICH MAY BE ENTERED)
    CHART       (GO TO THE GRAPHICS ANALYSIS SUBSYSTEM)
    --
+   ESARS       (GO TO THE ESARS RETRIEVAL SUBSYSTEM)
+   --
    FIFPAK      (GO TO THE 1970 5TH COUNT CENSUS RETRIEVAL SUBSYSTEM)
    --
    REAP        (GO TO THE 1960 CENSUS ET AL RETRIEVAL SUBSYSTEM)
    ---
    REPORT      (GO TO THE REPORT LISTING SUBSYSTEM)
    ---
    *           (ACCEPT THIS LINE AS A COMMENT FOR THE RECORD)
    -
    STOP        (AND LOG ME OFF THE LBL COMPUTER)
    ----
    HUB IS AT YOUR COMMAND.
    *NOTE THAT HUB WILL ACCEPT THE COMMAND "SESAME", BUT IT WILL NOT BE
    *ADVERTIZED IN THE ABOVE LIST.
    HELP
    THIS SEEDIS INTERACTIVE SUBSYSTEM IS DESIGNED SOLELY TO ALLOW YOU
    TO EASILY STARTUP ANY OTHER INTERACTIVE SEEDIS SUBSYSTEM AND TO GO
    FROM ONE TO THE OTHER IN ANY ORDER DESIRED.  EACH SEEDIS SUBSYSTEM
    ACCEPTS THE COMMAND "HUB" SO YOU MAY RETURN HERE (TO "THE HUB") IF
    YOU WISH TO GO FROM ONE SUBSYSTEM TO ANOTHER.

    CAVEAT--NOTE THAT THE VARIOUS SEEDIS INTERACTIVE SUBSYSTEMS WERE
    NOT DEVELOPED IN A STANDARD WAY.  THIS HAS BEEN DONE, AND WILL
    CONTINUE TO BE DONE, PURPOSELY SO THAT DIFFERENT LBL PERSONNEL MAY
    EXPERIMENT WITH DIFFERENT IDEAS AND APPROACHES TO INTERACTIVE
    SYSTEMS.  HOWEVER, THIS MEANS THAT THOSE WHO USE MORE THAN ONE
    SUBSYSTEM WILL OFTEN DISCOVER THAT THEY "DON'T ACT THE SAME WAY".
    IT IS THEREFORE IMPORTANT THAT YOU COMMENT LIBERALLY ON WHAT YOU
    LIKE AND DON'T LIKE AS YOU USE THESE SUBSYSTEMS.

    FOR FURTHER ASSISTANCE YOU MAY CONTACT MS. VIRGINIA SVENTEK AT
    (415)843-2740 X5216 (FTS 451-5216).
```

```
HUB IS AT YOUR COMMAND.
CHART
DOES YOUR TERMINAL PRINT DIRECTLY ON "PAPER" OR A "TV" SCREEN?
*SO THE "HUB" CAN TAKE CARE OF DETAILS LIKE THE ABOVE
*AUTOMATICALLY!
BOTH
PLEASE ENTER "PAPER" OR "TV".
PAPER
*AT THIS POINT THE VERSION OF CHART FOR TI TYPE TERMINALS WILL BE
*STARTED JUST AS THOUGH THE USER HAD DONE A
*↑LOAD,CHART,SEEDIS
*↑RUN
*IN SESAME.  IN THIS CASE THE RESPONSE WOULD BE...
 READY
*NOW USERS CAN DO THEIR THING IN CHART, THEN LEAVE VIA...
HUB
HUB IS AT YOUR COMMAND.
*NOTE THAT THE INTRO TO HUB IS GIVEN ONLY THE FIRST TIME IT IS
*ENTERED.
GARBAGE
COMMAND NOT UNDERSTOOD, YOU MAY ENTER THE CHAR ? FOR A LIST
HUB IS AT YOUR COMMAND.
RGNLMIS
*IF STARTUP MUST BE FROM MAG TAPE (WHICH WILL ONLY HAPPEN IF DISK
*AND PSS AND MSS ARE NOT AVAILABLE), THE FOLLOWING PROMPT WILL BE
*GIVEN...
THE COMPUTER OPERATORS MUST GET A MAGNETIC TAPE...
ESTIMATED WAIT WILL BE 1-5 MINUTES (19.41.13)
**********************************************


LBL RGNLMIS VERSION 7B (EFFECTIVE 19AUG76)


DATE/TIME- WEDNESDAY 01 SEP 76 19.44.26

YOU MAY ENTER THE CHARACTER ? FOR A LIST OF COMMANDS
(ALL YOUR LINES SHOULD END BY DEPRESSING THE 'RETURN' KEY)
AT YOUR COMMAND.
HUB
HUB IS AT YOUR COMMAND.
*ETC., ETC.
STOP
GOING ONCE...
GOING TWICE...
GONE!
JOB ENDED - DISCONNECTED
```

When HUB runs for the first time it executes the following control packet via a call to the NTRACT routine CCFILE...

```
      TEXT,TAPETTY,{ENTERING HUB...}. (MSG FOR USERS AT TERMINAL)
      TEXT,LINES  ,{ENTERING HUB...}. (MSG FOR RECORD SESSION)
+     .-----------------------------------------
+     . MAKE HUB A LOCAL FILE AND RETURN THE COMMON FILE FOR
+     . OTHER JOBS.
+     .-----------------------------------------------------
+     COPY,HUB/RX,TEMP/XR.
+     RENAME,TEMP=HUB.
      .-----------------------------------------------------
      . SET A FLAG ON DISK TO SIGNAL HUB HAS RUN
      .-----------------------------------------------------
      RETURN,HUBFLAG.
      TEXT,HUBFLAG,{HAS RUN}.
      .-----------------------------------------------------
      . DISPOSE THE "LINES" FILE TO 24X MICROFICHE WITH THE DT=R
      . OPTION SET (IN CASE THE FINAL BARBING IS NEVER
      . ACCOMPLISHED).
      .-----------------------------------------------------
      DISPOSE,LINES=TF,DT=R,RU,IF=0,DF=1,
      +T2={SEEDIS INTERACTIVE SESSION},
      +R={FLOOR 2 (VIRGINIA SVENTEK)//
      +SEEDIS INTERACTIVE SESSION ON THE -MA/
      +***ABNORMAL TERMINATION***}.
      .-----------------------------------------------------
      . DISPOSE THE FILE "OUTPUT" TO 24X MICROFICHE SO THAT IN CASE
      . THE FINAL BARBING IS NOT DONE IT WILL CONTAIN WHATEVER WAS
      . PUT ON IT BY THE SUBSYSTEMS PLUS THE COMPLETE DAYFILE, AND
      . SO THAT IF THE FINAL BARBING IS ACCOMPLISHED IT WILL
      . CONTAIN WHATEVER WAS PUT ON IT BY THE SUBSYSTEMS PLUS THE
      . BARBED RECORD SESSION PLUS THE COMPLETE DAYFILE.
      . (IF THE LATTER CASE HAPPENS, THE "LINES" FILE WILL NOT
      . BE DISPOSED.)
      .-----------------------------------------------------
      DISPOSE,OUTPUT=TF,DF=1,RU,IF=0,
      +T2={SEEDIS INTERACTIVE SESSION},
      +R={FLOOR 2 (VIRGINIA SVENTEK)//
      +SEEDIS INTERACTIVE SESSION ON THE -MA}.
      .-----------------------------------------------------
      . IF THE INTERAC INDEX USED BY HUB IS NOT PRESENTLY A
      . COMMON FILE, TRY TO CREATE IT FROM PSS OR TAPE.
      .-----------------------------------------------------
      ONSW,6. (IF PSS IS DN WHEN REFERENCED, GO TO CXIT)
      REWIND,HUBINDX.
      COMMON,HUBINDX.
      .-----------------------------------------------------
      . (HUBINDX COMMON FILE DID NOT EXIST...
      .  WILL TRY TO OBTAIN FROM PSS)
      .-----------------------------------------------------
      TEXT,HUBINDX,{FORCE TO EXIT}.
      HUBINDX. (FORCE TO EXIT)
      CXIT.
```

```
.-----------------------------------------------------------
.                COMMON FILE HUBINDX ALREADY EXISTS, SO...
.-----------------------------------------------------------
DELETE,HUBINDX. ...GET RID OF THE LOCAL FILE, AND THEN...
HUB.            ...RESTART HUB.
EXIT.
LIBCOPY,HUB,HUBINDX/RR,HUBINDX.
+       RETURN,HUBINDX. (RETURN THE NEWLY CREATED COMMON FILE)
HUB. (PSS SUCCESSFUL SO RESTART HUB)
EXIT.
CXIT.
FIN.
.-----------------------------------------------------------
. (PSS FAILED, SO TRY TAPE.)
.-----------------------------------------------------------
TEXT,TAPETTY,
{THE COMPUTER OPERATORS MUST GET A MAGNETIC TAPE...}.
TEXT,LINES,
{THE COMPUTER OPERATORS MUST GET A MAGNETIC TAPE...}.
TEXT,TAPETTY,
{ESTIMATED WAIT WILL BE 1-5 MINUTES (-TI)}.
TEXT,LINES,
{ESTIMATED WAIT WILL BE 1-5 MINUTES(-TI)}.
REQUEST,TAPE,{LIBRARY NO}. HUBINDX
COPY,TAPE/RX,HUBINDX/RR.
.-----------------------------------------------------------
. (THE TAPE WILL BE MADE EACH DAY TO KEEP THE
.  INDEX RELATIVELY UP TO DATE.)
.-----------------------------------------------------------
+       RETURN,HUBINDX. (RETURN THE NEWLY CREATED COMMON FILE)
HUB. (TAPE SUCCESSFUL SO RESTART HUB)
EXIT.
CXIT.
FIN.
.-----------------------------------------------------------
. TAPE ALSO FAILED SO ALERT USERS AND PLACE THEM
. BACK IN SESAME.
.-----------------------------------------------------------
+       DELETE,HUBINDX. (DELETE THE NEWLY CREATED COMMON FILE)
TEXT,TAPETTY,{HUB HAS FAILED TO START, PLEASE CONTACT...}.
TEXT,TAPETTY,
+{VIRGINIA SVENTEK, (415)843-2740 X5216 (FTS 451-5216)}.
TEXT,LINES,  {HUB HAS FAILED TO START, PLEASE CONTACT...}.
TEXT,LINES,
+{VIRGINIA SVENTEK, (415)843-2740 X5216 (FTS 451-5216)}.
EXIT.
CXIT.
FIN.
SESAME.
```

Next HUB obtains the SQUEEZE program (explained below) and any other files it needs via calls to the INTERAC routine FETCH.

When HUB is stopped via the STOP command the following control packet is executed via a call to CCFILE...

```
      TEXT,TAPETTY,{GOING ONCE...}.
      TEXT,LINES  ,{GOING ONCE...}.
      .-----------------------------------------------------------
      . PREPARE THE BARB INPUT FROM THE "LINES" FILE.
+     . (PROGRAM "SQUEEZE" SQUEEZES OUT BLANKS FROM LINES BEGINNING
+     . WITH A "C", "G", "T" OR "S" FOLLOWED BY 9 BLANKS.)
      .-----------------------------------------------------------
      RETURN,LGOB,SQUOZ,DIAGS,BARBOUT.
      COPY,LINES/RB,OFXB,NULL,1F,TEMP/XR.
      COPY,TEMP/RX,LINES/RR.
      LINK,B,F=SQUEEZE,L=NULL.
      LGOB,LINES,SQUOZ.
      REWIND,SQUOZ.
      TEXT,TAPETTY,{GOING TWICE...}.
      TEXT,LINES  ,{GOING TWICE...}.
      .-----------------------------------------------------------
      . PERFORM THE ACTUAL BARBING.
      .-----------------------------------------------------------
      BARB,SQUOZ,BARBOUT.
      EXIT.
      RETURN,LINES. (BARBING FAILED, DISPOSE THE LINES FILE)
      CXIT.
      RETURN,LINES. (BARBING FAILED, DISPOSE THE LINES FILE)
      FIN.
      .-----------------------------------------------------------
      . COPY THE BARBED RECORD SESSION TO THE FILE "OUTPUT"
      . (ALREADY DISPOSED TO 24X MICROFICHE)
      .-----------------------------------------------------------
      TEXT,OUTPUT,{$CL}.
      TEXT,OUTPUT,{$B=SEEDIS}.
      TEXT,OUTPUT,{$B=NTRACTV}.
      TEXT,OUTPUT,{$B=SESSION}.
      COPY,BARBOUT/RR,OUTPUT.
      TEXT,OUTPUT,{$CL}.
      TEXT,OUTPUT,{$B=DAYFILE}.
      .-----------------------------------------------------------
      . DISPOSE 2 COPIES OF THE RECORD SESSION (WITH COMPLETE
      . DAYFILES) TO FOG PAPER.
      .-----------------------------------------------------------
      COPY,BARBOUT/RR,FOG1/RB.
      COPY,FOG1/RB,FOG2/RB.
      DISPOSE,FOG1=PR,PA=1F,DF=1,DT=R,
      +T={SVENTEK//SEEDIS/NTRACTV/SESSION//SVENTEK},
      +R={FLOOR 2/VIRGINIA SVENTEK/FLOOR 2}.
      DISPOSE,FOG2=PR,PA=1F,DF=1,DT=R,
      +T={SVENTEK//SEEDIS/NTRACTV/SESSION//SVENTEK},
      +R={FLOOR 2/VIRGINIA SVENTEK/FLOOR 2}.
      DELETE,LINES. (PREVENTS DISPOSAL)
      TEXT,TAPETTY,{GONE}.
      EXIT.
      CXIT.
      FIN.
      END.
```

+ The same control packet is executed when the unadvertized SESAME
+ command is given, except that the "END" line is replaced by
+ "SESAME" and the "LINES" file is not deleted. The result is that
+ should the STOP command not be executed the session record will at
+ least be BARBED up to the last SESAME command given (the entire
BARB input on LINES will still be disposed to 24X fiche).

1) Existing control files are replaced by...

```
TEXT,TAPETTY,{YOU MAY NOW START THIS AND OTHER SEEDIS}.
TEXT,TAPETTY,{INTERACTIVE SUBSYSTEMS BY ENTERING }.
TEXT,TAPETTY,{THE FOLLOWING 2 LINES...}.
TEXT,TAPETTY,{COMMON,HUB.}.
TEXT,TAPETTY,{HUB.}.
TEXT,TAPETTY,{PLEASE CONTACT VIRGINIA SVENTEK IF}.
TEXT,TAPETTY,{YOU HAVE ANY PROBLEMS}.
TEXT,TAPETTY,{(415)843-2740 X5216 (FTS 451-5216)}.
TEXT,LINES  ,{  (SAME AS FOR TAPETTY, ABOVE)  }.
SESAME.
```

2) Session interaction may be preserved on the file "LINES" (file LINES is never repositioned!) this file is prepared for BARBING in the following way...

The file is read in 9A10 format,

lines which begin with a "c" follwed by 9 blanks will have the first 10 characters replaced with a "c", the BARB command for an absolute line,

lines which begin with a "g" followed by 9 blanks will have the first 10 characters replaced with a "g", the BARB command for an absolute boldfaced line,

lines which begin with a "t" followed by 9 blanks will have the first 10 characters replaced with a "t", the BARB command for a new title (HUB will make such an entry each time a subsystem is entered, thus resulting in a BARBED session preceded by a table of contents with an entry each time a
+ subsystem is entered),

+ lines which begin with a "s" followed by 9 blanks will have
+ the first 10 characters replaced with a "s", the BARB command for a new subtitle and

all other lines will have a "c" placed at their beginning.

3) Instead of END. or SESAME. execute the following...

```
RETURN,HUBFLAG.
TEXT,HUBFLAG,{STOP}. OR TEXT,HUBFLAG,{SESAME}.
HUB.
```

When HUB executes it will check this flag and automatically execute the STOP or SESAME command. This will satisfy the users' request and result in the BARBED record session being successfully produced.

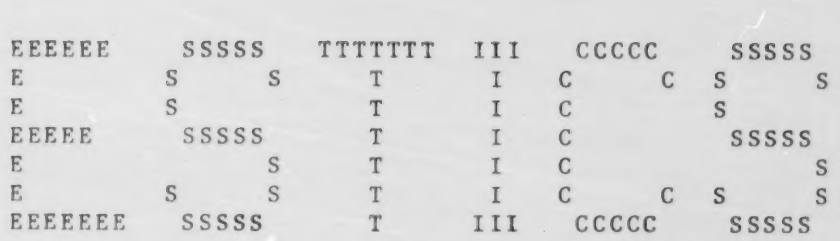
+ 4) Allow a "HUB" command.

+ 5) Do not advertize a "SESAME" command.

APPENDIX F:

ESTICS DOCUMENTATION

(UCID - 3876)


EEEEEE SSSSS TTTTTTT III CCCCC SSSSS
E S S T I C C S S
E S T I C S
EEEEE SSSSS T I C SSSSS
E S T I C S
E S S T I C C S S
EEEEEEE SSSSS T III CCCCC SSSSS

EMPLOYMENT SERVICE TABLE INDEPENDENT CELL SYSTEM

(A LBL SEEDIS/RMIS PROJECT)

(VERSION 1 - 03DEC76)

Comments may be addressed to

Bradford Heckman
Room 3211A, Building 50B
Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720
(415) 843-2740 x6068 (FTS 451-6068)

(This writeup is in PSS library ESTICS, subset WRITEUP)

TABLE OF CONTENTS 18 JAN 77

1. INTRODUCTION 1
   1.1 TO THIS DOCUMENT 1
   1.2 TO THE PROJECT 2

2. PROJECT PERSONNEL 3

3. PROJECT ACTIVITY FLOWCHART 5

4. PROJECT ACTIVITY LOG (HIGHLIGHTS) 6

5. SCOPE/GOALS OF THE PROJECT 9
   5.1 ESTICS OVERVIEW 9
   5.2 ESTICS OPERATION AT LBL 10
   5.3 EASY USER ONLINE INTERACTION (UOI) SYNTAX 12
   5.4 DETERMINATION OF TIC'S IN THE ESTICS DATABASE 13
   5.5 EASY VIEW OF DATA ORGANIZATION 14
   5.6 INTERACTIVE ACCESS TO HUGE AMOUNTS OF DATA 15
   5.7 ES AGENCY TIC RECORD STRUCTURE 16
   5.8 EXPORTATION OF LBL TOOLS 17

6. SYNTAX OF THE USER ONLINE INTERACTION (UOI) 18

7. INTERAC 44

8. BERKELEY DATABASE MANAGEMENT SYSTEM (BDMS) 45
   8.1 OVERVIEW 45
   8.2 ESTICS DATA STRUCTURE USING BDMS 46
      DATABASE TYPE 1 - AREA/MONTH SUBBLOCKS 48
      DATABASE TYPE 2 - CELL DICTIONARY 50
      DATABASE TYPE 3 - DATA ELEMENT DESCRIPTORS 52

A. REFERENCES 54

B. LOCATION OF LBL SOFTWARE AND OTHER DOCUMENTATION 55

C. FORMAL CONTRACT 56

INDEX 57

1.1 TO THIS DOCUMENT

This document was begun in early August, 1976, as an ongoing communication media for all personnel involved with the development of the project (versus those who use products/tools that result). Some of its specific purposes are to

describe past and present activities,

develop and describe future activities,

develop and provide specifications for programming and to provide project documentation.

The overriding point I wish to make and stress to all personnel is that they tell me when they know (or even just think/suspect/feel) that something in this document is inaccurate. Remember that this document will hook everyone involved not just to Brad Heckman but with everyone else! In addition, I hope that all personnel will at anytime contribute their thoughts/ideas as to how the project should proceed from thereon.

To aid readers in wading around in this document, I will attempt to provide a comprehensive **index** with all occurances in **boldfaced type** and to expand **acronyms** the first time they are used. To aid in "seeing what's new" from one version of this document to the next I will indicate significant changes in the left margin for two versions back, the most recent changes via a + (plus) and the next most recent via a - (dash).

1.2 TO THE PROJECT

In mid 1974 LBL, in conjunction with the Region IX Department of Labor Employment and Training Administration (DOL-ETA), began the research and development of a "Regional Computer Based Management Information System" (RMIS) to further augment the "Socio-Economic-Environmental-Demographic Information System" (SEEDIS) already under development at LBL under partial sponsorship of DOL-ETA. As activity progressed, a contract modification was made to include the investigation of improving one of the systems which provides data to RMIS, namely the Employment Security Automated Reporting System (ESARS). This portion of the RMIS project has become known to some as "ESARS Redesign," but it is actually a new design of only a portion of the present ESARS and is known at LBL as "ESTICS."

Because this is a research project limited to the development of prototypes at LBL, the contract (see appendices) does not address the specifics of implementing any new capability which may be found desireable. However, it does call for a consulting role "to the extent of available resources" in such matters.

(Note - LBL/CSAM is the LBL "Computer Science and Applied Mathematics" Department.)

Don Austin - (415)843-2740x5313, (FTS)451-5313.
Assistant Head of LBL/CSAM.

Bruce Bargmeyer - (415)556-3502, (FTS)???-????.
Manpower Analyst for Management Data Systems Analysis (MDSA) of Region IX DOL/ETA. A "Regional Office RMIS Project Coordinator" with particular involvement in data acqusition, user online interaction (UOI) syntax and "field development" (getting the word out to DOL users of LBL prototypes).

Bob Beasley - (202)376-6454, (FTS)376-6454.
Manpower Analyst, Office of Management Tnformation Systems (OMIS) of the Office of Administration and Management (OAM) of DOL/ETA. A "National Office RMIS Project Coordinator" with particular involvment in the identification of "Table Independent Cells" for the LBL prototype "ESTICS" via a "symbolism" he devised.

Tricia Coffeen - (415)843-2740x6371, (FTS)451-6371.
LBL/CSAM Computer Scientist involved with the implementation of the UOI syntax computer programs. This includes LBL testing activity and interfaces to INTERAC and BDMS. She is also involved with BDMS implementation via another project.

Wen-Sue Gee - (415)843-2740x5307, (FTS)451-5307.
LBL/CSAM Computer Scientist involved with the testing and implementation of the INTERAC module with existing RMIS prototypes.

Bob Healey - (415)843-2740x5684, (FTS)451-5684.
LBL/CSAM Computer Scientist involved with the implementation of INTERAC.

Brad Heckman - (415)843-2740x6068, (FTS)451-6068.
LBL/CSAM Computer Scientist, Coprincipal investigator (with Carl Quong) of the RMIS project. Project leader of the RMIS project. Significant player in the creation of RGNLMIS, INTERAC, HUB and ESTICS.

Matt Kessler - (202)376-6756, (FTS)376-6756.
(Title?) for the Division of Data and Cost Analysis of the United States Employment Service (USES). A "National Office RMIS Project Coordinator."

Suzanne Kranz - (415)843-2740x5596, (FTS)451-5596.
LBL/CSAM Budget Officer and Project Coordinator.

Walter Postle - (415)556-3502, (FTS)???-????.
Regional Economist, head of Management Data Systems Analysis for Region IX DOL/ETA. A "Regional Office RMIS Project Coordinator."

carl Quong - (415)843-2740x6330, (FTS)451-6330. Head of LBL/CSAM. Coprincipal Investigator (with Brad Heckman) of the RMIS project.

dave Richards - (415)843-2740x5766, (FTS)451-5766.
LBL/CSAM Computer Scientist involved with the creation of BDMS.

Terry Wiram - (202)376-6176, (FTS)376-6176.
Computer Systems Analyst for the Division of ADP Systems of the Office of Administration and Management (OAM) of DOL/ETA. A "National Office RMIS Project Coordinator" particularly involved with the design and testing of the ES Agency TIC record structure and the possible implementation of LBL research results on DOL computer systems.

Note that those activities presently at the head of the priority list are boldfaced. Those which are presently considered complete are boldfaced AND CAPITALIZED.

1) REVIEW THE DETAIL DATA COLLECTION PROCEDURE AND IDENTIFY DATA ITEMS AVAILABLE IN THE ESARS SOURCE FILES.

2) DETERMINE THE TIC'S AND GEOGRAPHIC DETAIL WHICH SHOULD BE CONTAINED IN THE ESTICS SUMMARY DATA STRUCTURE.

3) Design the ES Agency TIC record structure in close cooperation with the National Office so that it is "reasonable" for the ES Agencies' processing resources to produce them and so that it will interface with BDMS at LBL and TPL at the National Office (and ES Agencies which have access to TPL).

4) Design, develop, test and implement the INTERAC module with existing RMIS interactive tools.

5) Complete the implementation of the BDMS capability needed by the LBL prototype ESTICS.

6) DESIGN THE UOI SYNTAX AND BDMS ESTICS SUMMARY DATA STRUCTURE IN CONJUNCTION IN AN ITERATIVE PROCESS.

7) Design the interfaces between the UOI syntax module and the INTERAC and BDMS modules.

8) Create dummy test BDMS databases for testing the interactive tools.

9) Create and test the software for the interactive tools prototype.

10) Test LBL prototype interactive tools with "live data" provided by the National Office.

11) General specification of the type of computing resources needed for implementation of LBL prototypes at other sites.

12) Consultation with DOL personnel on any implementation of LBL prototypes which they might desire.

Note that activities are keyed to the "ACTIVITY FLOWCHART" of the previous chapter.)

1) DEC74 (signing of initial RMIS contract) to present - ESARS documentation on data collection and source file content reviewed (Chapters 4 and 6).

1-12) 30JUN75 - formal contract modification signed (see appendices).

2) OCT75 - Bob Beasley presents his method of identifying TIC'S to LBL, namely the "ESARS Summary Database Symbolism."

2) OCT75 - after review by LBL, it is agreed that the TIC symbolism of Bob Beasley is comprehensive, and is even applicable to noncomputer personnel oriented interactive tools. It is also agreed to operate (at least initially) with the assumption that the TIC'S defined for the database should reflect data items presently available in the ESARS summary tables, including the nonfederal items. Because of Bob Beasley's intimate knowledge of these tables as well as the symbolism, he agrees to identify these initial TIC'S.

1) 4-6NOV75 - Brad Heckman attends the National meeting of ES ADP mamagers in Kansas City with special emphasis on the "consolidation effort." At that meeting the "Base Support System (BSS)" is presented as generalized software to consolidate the production of ES detailed source files. BSS was developed by the Nevada ES Agency and advertizes the following characteristics -

it is not vendor oriented,

it is not hardware dependent,

it does not require equipment upgrade,

it is as "exportable" as ANS COBAL,

it runs in batch and real time,

it is an accumulation of small software "modules" allowing

various combinations of implementation depending on a ADP system's size and an ES Agency's needs and

operation on the "minimum system" as defined by the National Office, and

it is similar to software already in use in Nevada which has been successfully exported to a different state.

2) NOV75 - list of TIC'S reflecting the content of the present ESARS summary tables received from Bob Beasley.

2) DEC75 - revised and updated list of TIC'S reflecting the content

of the present ESARS summary tables received from Bob Beasley.

4) 30DEC75 - initial INTERAC design document completed by Brad Heckman (see reference xyz).

4) JAN76 - INTERAC development and testing begins by Bob Healey.

2) 4FEB76 - agreement is made for the National Office to keypunch the TIC'S and send them to LBL on magnetic tape.

2) 25MAR76 - TIC list tape received at LBL.

5) APR76 - Tricia Coffeen comes on board. Her project time is to be split between the BDMS and ESTICS projects, but there is much overlap. She begins a study of the RMIS project to date. She begins an investigation of BDMS with regard to the apparent needs of ESTICS. She cracks the symbolism TIC list tape.

5) APR76 to present - Tricia Coffeen continues development activity on BDMS with an eye toward ESTICS needs.

3) 17-18JUN76 - Terry Wiram and Brad Heckman meet in Berkeley. They agree on ES Agency TIC record structure design specifications which seem reasonable for ES Agencies to produce and for interfacing to both BDMS at LBL and TPL at the National Office.

12) 17-18JUN76 - Terry Wiram and Brad Heckman meet in Berkeley. Terry informs Brad that DOL "hopes to implement" an ESTICS as a National system by FY78. Brad explains that although that is DOL's business, they should realize that LBL/CSAM sees its role as that of researcher, experimenter, model builder; to make any definite plans based on such efforts before the results are known is perhaps premature. Brad further points out that any interactive prototypes produced would require much human and probably additional hardware resources to implement elsewhere, and that LBL sees its role in any such implementation efforts as a consultant on how its prototypes work, not as the actual implementer.

4) AUG76 - INTERAC testing with existing RMIS interactive tools begins by Wen-sue Gee and Bob Healey.

4) AUG76 - design of the UOI syntax and ESTICS BDMS data structure begins by Brad Heckman.

7) 30NOV76 - the design of the UOI syntax and ESTICS BDMS data structure is completed and agreed upon by Brad Heckman and Tricia Coffeen.

7) 30NOV76 - the design of the logic for the interfaces between the UOI syntax module and the INTERAC and BDMS modules begins by Tricia Coffeen.

9) 30NOV76 - the design of the logic for coding the software for the UOI syntax module begins by Tricia Coffeen.

1-12) **3DEC76** - Version 1 of this document is readied for distribution to the players on the list in the "PROJECT PERSONNEL" Chapter.

5.1 ESTICS OVERVIEW

The present ESARS computer software is designed to produce a specific portion of a particular set of tables from a particular set of input data. This means that when the input data requirements and/or the table format requirements change, the software must also be changed (that is, the software is "table dependent"). THIS RESULTS IN DELAYS. A goal of this research is to design and implement a prototype summary data structure which will not require alteration when input and output requirements change ("table independence"), but will continue to allow the same tabluar reporting as before. Another way to describe such a table independent structure is that it will expect changes in the input and output requirements and therefore will not be affected adversely by such changes. Another, perhaps more important, goal of this research is to design and implement prototype interactive tools which will allow retrieval of and analysis and reporting on data at a "computer terminal" in a location remote from the "computer."

5.2 ESTICS OPERATION AT LBL

ESTIC DATABASE (SEE CHAPTER 8)
("SUBBLOCKS" CORRESPOND TO ONE AREA, MONTH AND YEAR)
(EACH SUBBLOCK IS A "BDMS DATABASE")
AREA 1, MNTH 1
AREA 1, MNTH 2
AREA 2, MNTH 1
AREA 2, MNTH 2
AREA N, MNTH N
INTERAC (SEE CHAP 7)
PROVIDES LBL ACCESS TO ONE OR MORE SUBBLOCKS
BDMS (SEE CHAP 8)
RETRIEVES RECORDS (FROM SUBBLOCKS) WHICH MAY BE LATER SEARCHED SEQUENTIALLY
UOI SYNTAX (SEE CHAP 6)
-RETRIEVAL
-ANALYSIS
-REPORTING
-ADVANCED ANALYSIS (SPSS, ETC.)

(THE USER)

5.3 EASY USER ONLINE INTERACTION (UOI) SYNTAX

This is mentioned before such subjects as "data structures" and "report generation" for a couple of reasons. First, the development of interactive, or "online", tools which are usable on the ESTICS data structure by noncomputer people is the main thrust of the ESTICS effort at LBL. Secondly, the capability allowed through the syntax determines the final state of the data structure. Therefore, the syntax will be designed in conjunction with the data structure in an iterative fashion. This will be done to prevent the situation in which a data structure is designed and set in concrete before the syntax is thoroughly thought out, the result being that only a limited amount of the capability desired is "discovered" to be possible without a major investment of more resources.

The syntax is designed to allow the following capabilities with regard to general "human-machine-human communication" (humans communicating with each other through an automatic machine process)-
(see RGNLMIS tech docmntn)

The syntax is designed to initially allow the following specific capabilities with regard to the ESTICS database-
(see notes)
see the chapter on "UOI SYNTAX" for a detailed description.

Later a similar syntax is planned to allow analysis and reporting capabilities in an interactive mode.

5.4 DETERMINATION OF TIC'S IN THE ESTICS DATABASE

The "table independent cells" are not only identified by textual labels, but also by "area type," "frequency," "time period," "breakout" and "federal requirement" (see the "ESTICS CELL DICTIONARY DATA STRUCTURE" in the BDMS chapter). Because of the generality of the ESTICS summary data structure, it would be easy to allow any installation processing such data to define any cells they wish. However, this would cause havoc with application programs designed to compare regions and time periods. Therefore, someone must be responsible for allowing new cells to be defined. The process presently envisioned is for the National Office to originally define cells similar to those presently available in the ESARS summary tables. In the future, it is assumed that any suggestions for newly defined cells will be accepted at the National Office as new nonfederally required cells, but they will be advertized to everyone participating in the system, just as new federally required cells are. This will give other areas an opportunity to produce them, and application programs may be written with full knowledge of what the universe of TIC'S is.

5.5 EASY VIEW OF DATA ORGANIZATION

A goal of this project is to make the details of actual data structuring on the LBL computer system as transparent as possible to the programmers who develop applications of the database. This allows such programmers to concentrate more on applications in the first place, but perhaps more importantly it also allows them to develop and alter applications without having to alter the actual database itself. A system which allows such a logical or "picture" view of a database has come to be generally know in the computer field as a "database management system (DBMS)." The particular DBMS to be used with ESTICS is under development at LBL and is know as the Berkeley Database Management System (BDMS). It is described in detail in a later chapter called "BDMS."

5.6 INTERACTIVE ACCESS TO HUGE AMOUNTS OF DATA

When very large databases are encountered (say greater than a few magnetic tapes worth) it becomes unreasonable with today's machinery to have the entire database available on a high speed, randon access, rewritable device (usually "disk") because of space limitations. Therefore, interactive applications to such databases are faced with the problem of slow response time due to the necessity of using bulk type storage which is typically slow, sequential, nonrewritable or unreliable, if not some combination of these! The approach taken with the huge ESTICS database is to first divide the database into many smaller logical "subdatabases", namely by area, month and year. Next, these subdatabases are transferred to disk storage in such a way that overall response time is not significantly impaired. The system which allows this tranference at LBL is explained in detail beginning in the chapter called "INTERAC".

5.7 ES AGENCY TIC RECORD STRUCTURE

This is the structure which LBL recommends be produced by the ES agencies if they were to use ESTICS as demonstrated at LBL. It is designed to interface as easily as possible with 1) ES agency processing capabilities, 2) LBL BDMS and 3) the "Table Producing Language (TPL)". The latter is a batch mode report generation package presently available at the National Office. Success of this interface is the key to allowing the present ESARS type batch tabular summary reports to be produced from the ESTICS structure.

(Put structure here)

5.8 EXPORTATION OF LBL TOOLS

Although the contract for this research project does not specifically cover the topic of exportability of any prototypical tools produced, it appears to be a popular subject among those involved, and the Principle Investigators of the RMIS project have agreed to address the situation.

"Exportability", like security, is a matter of degree. It makes little sense to talk of a prototype computer program being either "exportable" or "nonexportable", period. If TPL is successfully interfaced to the ES agency produced TIC records, then that portion of the research is highly exportable. This would mean the ability of the National Office (and the ES agencies which can run TPL) to produce the present tablular type reports, but with none of the delays presently experienced. The interactive tools, however, are based on modules which for the most part are highly nonexportable, especially with regard to hardware. An exception is the very important BDMS module, which is designed for a high degree of machine independence (though written in FORTRAN). The other modules, however, will be well documented so that the logic could be easily reproduced on any central processing system, or more likely distributed processing system, with an appropriate type and amount of hardware to implement such tools.

```
**********************************************************

THIS PROGRAM IS "LBL-ESTICS," VERSION 1A (EFFECTIVE 05JAN77).

THE PRESENT DATE IS WEDNESDAY, 05 JAN 77.
THE PRESENT TIME IS 19.25.33 (IN BERKELEY).

YOU MAY WANT TO ENTER THE LINE "WHAT IS THE NEWS?" TO OBTAIN
INFORMATION ABOUT RECENT CHANGES TO THE LBL-ESTICS PROGRAM.

YOU MAY ALSO WANT ENTER THE LINE "WHAT ARE THE COMMANDS?"
(ALL YOUR LINES SHOULD END BY DEPRESSING THE CARRIAGE RETURN KEY.)

LBL-ESTICS IS NOW AT YOUR COMMAND.
*IN THE FUTURE, THIS PROMPT IS ABBREVIATED TO "AT YOUR COMMAND."
WHAT ARE THE COMMANDS?
HELP      (ME, I'M A NEW USER)
----      (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
WHAT      (IS VARIOUS GENERAL INFORMATION)
--
SCAN      (A LIST FOR LINES CONTAINING PARTICULAR CHARACTERS)
--
RESCAN    (THE RESULT OF THE LAST SCAN OR RESCAN COMMAND)
---
AREA      (OF THE DATA WANTED)
--
REAREA    (BEGIN NEW AREA SPECIFICATION)
---
DATE      (OF THE DATA WANTED)
--
REDATE    (BEGIN NEW DATE SPECIFICATION)
---
LABEL     (OF THE DATA WANTED)
--
RELABEL   (BEGIN NEW LABEL SPECIFICATION)
---
OUTPUT    (THE DATA FOR THE AREAS, DATES AND LABELS SPECIFIED)
--
BREAKOUT  (THE DATA BY GROUP TYPE OTHER THAN ALL APPLICANTS)
--
REBREAK   (BEGIN NEW BREAKOUT SPECIFICATION)
---
PERIOD    (CELL TIME PERIOD OTHER THAN FISCAL YEAR TO DATE)
--
*         (ACCEPT THIS LINE AS A COMMENT FOR THE RECORD)
-
HUB       (LEAVE LBL-ESTICS AND GO BACK TO THE SEEDIS "HUB")
---
STOP      (ESARS AND DISCONNECT MY TERMINAL FROM THE COMPUTER)
----
AT YOUR COMMAND.
WHAT IS THE NEWS?
THE IDEA OF "THE NEWS" IS TO ALLOW A RUNNING COMMENTARY OF SHORT TERM
"EMERGENCY" TYPE SITUATIONS THAT USERS' SHOULD BE "CLUED IN ON".  AN
EXAMPLE WOULD BE THAT SUCH-AND-SUCH A PROBLEM HAS BEEN DISCOVERED AND IT
```

WILL BE FIXED AT SUCH-AND-SUCH A TIME. EACH ENTRY SHOULD BE DATED IN REVERSE CHRONOLOGICAL ORDER WITH A LIMIT FOR ALL ENTRIES OF ABOUT A PAGE. AT YOUR COMMAND.

*

* **GENERAL INFORMATION**

*

*THIS CHAPTER IS DESIGNED TO

* 1)DEMONSTRATE THE UOI SYNTAX TO ANYONE INTERESTED AND

* 2)PROVIDE SPECIFICATIONS OF THE UOI SYNTAX FOR PROGRAMMING.

*

*USER INPUT IS BOLDFACED. COMPUTER OUTPUT IS NOT.

*

*NONALPHABETIC CHARACTERS MAY PRECEED COMMANDS.

*

*WHEN A "YES" OR "NO" RESPONSE IS IMPLIED, ANY RESPONSE WHICH IS NOT

*A VALID COMMAND AND WHOSE 1ST ALPHABETIC CHARACTER IS AN "N" IS

*CONSIDERED TO MEAN "NO." ANY OTHER RESPONSE IS CONSIDERED "YES."

*

*WHEN "EXAMPLE" IS IMPLIED AS AN UNDERSTANDABLE RESPONSE, ACCEPT

*"EX" AS THE 1ST 2 ALPHANUMERIC CHARACTERS ENTERED.

*

*COMMANDS ONLY REQUIRE A MATCH WITH THE "MINIMUM CHARACTERS," AS

*INDICATED IN THE ABOVE COMMAND LIST. THIS HAS THE POSITIVE EFFECT

*OF ALLOWING MISPELLINGS AND TYPOS. (IT HAS THE NEGATIVE EFFECT OF

*UNDERSTANDING NONCOMMAND INPUT AS COMMANDS; "PEROID," "PERSON" AND

*"PEANUT" WOULD ALL BE DECODED AS THE COMMAND "PERIOD."

*

HELP

SPECIFIC HELP IS AVAILABLE FOR EACH COMMAND BY ENTERING THE COMMAND.

IF YOU WOULD LIKE TO TALK WITH SOMEONE AT LBL PLEASE ENTER "WHO IS GINNY?"

WOULD YOU LIKE A GENERALIZED OVERVIEW (2 PAGES) AT YOUR TERMINAL?

YES

THIS HUMAN-MACHINE INTERACTIVE PROGRAM IS DESIGNED TO BE USED BY PEOPLE WITHOUT TECHNICAL BACKGROUNDS. IT IS MEANT TO BE HIGHLY SELF TEACHING, BUT THE FOLLOWING GENERALIZED IDEAS MAY BE HELPFUL TO MANY READERS.

****

COMPUTERS DON'T THINK.

****

YOU ARE COMMUNICATING WITH OTHER HUMAN BEINGS WHEN YOU USE LBL-ESTICS, NAMELY THE "COMPUTER PEOPLE" WHO DIRECTLY SET UP THE DATA AND MACHINERY (OFTEN ALL LUMPED TOGETHER AND CALLED "THE COMPUTER") TO AUTOMATICALLY RESPOND TO YOUR ENTRIES, AND ALSO "NONCOMPUTER PEOPLE" WHO HAVE OFFERED SUGGESTIONS ON HOW TO IMPROVE THE COMMAND LIST AND THE RESPONSES GIVEN. A "COMPUTER" CAN NO MORE "THINK," AND THEREFORE "COMMUNICATE," THAN AN AUTOMATIC TELEPHONE ANSWERING SYSTEM CAN. THOSE OF US HUMANS WHO HAVE GONE BEFORE YOU HAVE SET UP LBL-ESTICS TO PRESENT WHAT YOU ARE NOW READING WHEN YOU ASK FOR HELP AS A NEW USER. WE ASK YOU TO REMEMBER THIS, TO JOIN US IN THE CONSTANT IMPROVEMENT PROCESS AND TO PASS THE WORD TO OTHER HUMANS THAT "COMPUTERS" ARE SIMPLY TOOLS, AND IT MAKES NO MORE SENSE TO "TALK TO COMPUTERS" THAN IT DOES TO "TALK TO YOUR TYPEWRITER."

****

YOU CAN'T DAMAGE ANYTHING.

****

EVERY LINE YOU ENTER WILL RECEIVE A RESPONSE (UNLESS IT'S A COMMENT OR UNLESS YOU HAVE SPECIFICALLY ASKED FOR NO RESPONSE). IF THE PROGRAMMING

IS NOT ABLE TO DETERMINE WHAT YOU HAVE COMMANDED, YOU WILL RECEIVE RESPONSES DESIGNED TO HELP CLEAR UP THE CONFUSION. IN OTHER WORDS, THIS PROGRAM EXPECTS YOU TO JUST TRY COMMANDS WITHOUT READING ALOT OF INSTRUCTIONS. THEREFORE, YOU SHOULD NOT HESITATE TO TRY ENTRIES EVEN WHEN YOU ARE NOT SURE THEY ARE "RIGHT." IN FACT, BEING RELAXED AND SPONTANEOUS AT THE KEYBOARD IS ESSENTIAL TO LEARNING THE CAPABILITIES OF LBL-ESTICS.

****

YOU ARE IN COMMAND (NOT THE COMPUTER).

****

YOU MAY GIVE A NEW COMMAND ANY TIME THE COMPUTER IS NOT IN THE PROCESS OF RESPONDING TO YOUR PREVIOUS COMMANDS (EVEN THEN YOU MAY COMMAND THAT THE RESPONSE BE STOPPED.)

****

YOU MAY TERMINATE COMPUTER OUTPUT AT ANY TIME.

****

ALTHOUGH LBL-ESTICS IS DESIGNED TO AUTOMATICALLY PREVENT YOU FROM INADVERTENTLY BEING DELUGED WITH LARGE QUANTITIES OF OUTPUT FROM A SINGLE COMMAND, YOU MAY STILL FIND YOURSELF GAZING AT A TERMINAL WHICH IS SPEWING FORTH A BUNCH OF STUFF YOU WOULD JUST AS SOON STOP. THE PROCEDURE FOR DOING SO IS GIVEN BELOW.

1) ENTER A GREATER THAN SIGN (>) AND WAIT
   (ANY OUTPUT BEING RECEIVED AT YOUR TEMINAL SHOULD STOP WITH THE GREATER THAN SIGN AT THE BEGINNING OF A LINE)
2) ENTER THE 4 CHARACTERS "DROP" AFTER THE GREATER THAN SIGN
   (DO NOT ENTER A CARRIAGE RETURN OR LINE FEED FIRST)
3) ENTER A CARRIAGE RETURN AND WAIT
   (THE OUTPUT SHOULD QUICKLY TERMINATE WITH "AT YOUR COMMAND.")
4) PROBLEMS?
   (ENTER A COLON FOLLOWED BY A CARRIAGE RETURN AND GO BACK TO STEP 1)

IT IS RECOMMENDED THAT YOU PRACTICE THIS RIGHT AWAY SO THAT WHEN YOU REALLY NEED IT YOU'LL KNOW JUST WHAT TO DO.

****

YOU MAY LIMIT COMPUTER RESPONSES.

****

AS YOU GAIN EXPERIENCE WITH LBL-ESTICS YOU WILL FIND THAT YOU WILL BE ABLE TO PREDICT WHAT COMPUTER RESPONSES WILL BE IN MANY SITUATIONS. FOR ANY PARTICULAR COMMAND, YOU MAY SPECIFY THAT YOU WANT COMPUTER RESPONSES LIMITED BY ENDING THE COMMAND WITH THE CHARACTER ↑. IF YOU WANT TO LIMIT COMPUTER RESPONSES FOR ALL COMMANDS UNTIL YOU SAY OTHERWISE, ENTER A LINE WITH A DOUBLE ↑↑ ONLY AND ENTER THE SAME LINE WHEN YOU WANT THE RESPONSES BACK. IN THE LATER MODE, ENDING A COMMAN WITH AN ↑ WILL TURN THE LIMITED RESPONSES BACK ON FOR THAT COMMAND ONLY! (IF THIS ALL SOUNDS CONFUSING, A LITTLE EXPERIMENTATION WILL HOPEFULLY CLEAR THINGS UP.)

****

DATA RETRIEVAL.

****

THE LBL-ESTICS DATABASE IS SUBBLOCKED BY AREA AND DATE (E.G., THE STATE OF HAWAII FOR SEPTEMBER, 1976, OR THE UNITED STATES FOR MARCH, 1975). THE DATA CELLS IN EACH SUBBLOCK ARE LABELED (E.G., APPLICANTS UNDER 20 YEARS OF AGE PLACED IN NONAGRICULTURAL INDUSTRIES, COUNTING INDIVIDUALS, NOT PLACEMENT TRANSACTIONS). ALSO, SOME CELLS ARE "BROKEN OUT" BY MINORITY, ECONOMICALLY DISADVANTAGED, VETERAN, ET AL. IF YOU DO NOT SPECIFY ANY BREAKOUTS, ALL APPLICANTS WILL BE ASSUMED. LIKEWISE A TIME "PERIOD" OF FISCAL YEAR TO DATE WILL BE ASSUMED FOR THE CELLS UNLESS OTHERWISE SPECIFIED. AFTER YOU SPECIFY WHICH AREAS, DATES, CELLS, BREAKOUTS AND

```
PERIOD YOU ARE INTERESTED IN YOU COMMAND "OUTPUT" AND THE DATA VALUES ARE
GIVEN AT YOUR TERMINAL.  YOU MAY "BUILD UP" THE AREAS, DATES, CELLS AND
BREAKOUTS YOU ARE INTERESTED IN AS YOU GO ALONG, OR YOU MAY START THEM
OVER.
(REMEMBER THAT THIS IS JUST AN OVERVIEW.  EXPERIMENTATION WITH LBL-ESTICS
IS THE KEY TO LEARNING HOW TO ACTUALLY USE IT.)
WELCOME AND HAPPY HUNTING.
AT YOUR COMMAND.
WHO IS GINNY?
"GINNY" IS MS. VIRGINIA SVENTEK, (415)843-2740X5216, (FTS)451-5216.
SHE UNDERSTANDS LBL-ESTICS AND OTHER SEEDIS SUBSYSTEMS FROM THE USERS' (AS
OPPOSED TO THE CREATORS') POINTS OF VIEW.  SHE WILL BE HAPPY TO TALK TO
YOU AND HELP YOU WITH ANY PROBELM YOU MIGHT HAVE, WHICH MAY SIMPLY MEAN
REFERRING YOU TO "THE RIGHT PERSON TO TALK TO".
AT YOUR COMMAND.
WHAT
THE FOLLOWING USER INPUT IS DECODED FOR THE "WHAT" COMMAND...
CA          (CHARACTERISTICS OF APPLICANTS CELL LABELS)
--          (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
CJ          (CHARACTERISTICS OF JOB ORDERS CELL LABELS)
--
CE          (CHARACTERISTICS OF EMPLOYERS CELL LABELS)
--
AI          (ACTIVITY, COUNTING INDIVIDUALS CELL LABELS)
--
AT          (ACTIVITY, COUNTING TRANSACTIONS CELL LABELS)
--
OA          (OCCUPATIONAL CODES OF APPLICANTS CELL LABELS)
--
OJ          (OCCUPATIONAL CODES OF JOB ORDERS CELL LABELS)
--
AREA TYPES  (AVAILABLE FOR RETRIEVAL)
--
BREAKOUTS   (OF PEOPLE BY FUNDAMENTAL CHARACTERISTICS)
--
CODES       (FOR NONSMSA SUBSTATE AREAS)
--
GINNY       (A HELPFUL HUMAN AT LBL WHO LIKES USERS)
--
LABELS      (GENERAL DISCRIPTION)
--
LBL-ESTICS  (BRIEF DESCRIPTION)
--
LISTS       (OF INFORMATION RELATING TO LBL-ESTICS)
--
NEWS        (RECENT DEVELOPMENTS IN THE ALWAYS CHANGING LBL-ESTICS)
--
PERIODS     (GENERAL DESCRIPTION)
--
SMSA'S      (NAMES OF THOSE AVAILABLE IN ESTICS)
--
STATES      (2 LETTER ABBREVIATIONS)
--
AT YOUR COMMAND.
*NOTE THAT THE "WHAT" COMMAND IS THE ONLY ONE WHICH WILL NOT ALLOW
```

```
*USER ENTRIES OF INPUT WITHOUT FIRST REENTERING THE COMMAND.  THIS
*IS DONE TO SOLVE THE PROBLEM OF "AREA TYPES,", "BREAKOUTS,"
*"LABELS" AND "PERIODS" BEING MISUNDERSTOOD AS COMMANDS.  HOPEFULLY
*USERS WILL NOT FIND THIS CONTRADICTION SIGNIFICANT ENOUGH TO
*COMPLAIN.  IF SO WE WILL THEN MAKE AMMENDS.
WHAT CA
"CA" INDICATES A SUBDIVISION OF CELL LABELS APPLICABLE TO CHARACTERISTICS
OF APPLICANTS.  THE CODES OF PARTICULAR "CA LABELS" OF INTEREST MAY BE
FOUND VIA THE "SCAN" COMMAND.  THE TEXT FOR A PARTICULAR "CA LABEL CODE"
OF INTEREST MAY BE FOUND VIA THE "WHAT" COMMAND (E.G., "WHAT IS AI050?").
WOULD YOU LIKE TO SEE A XYZ PAGE LIST OF ALL CA LABELS AVAILABLE?
*IF AFFIRMATIVE THE "LIST" COULD BE GIVEN AT THE USER'S TERMINAL
*VIA A SEARCH THROUGH THE "DATA ELEMENT DESCRIPTION" BDMS
*DATABASE.  HOPEFULLY, USERS WILL NOT BE INTERESTED IN DOING THIS.
*
*THE SAME PROCESS HOLDS FOR THE REST OF THE CELL LABELS.
WHAT IS LBL-ESTICS?
"LBL-ESTICS" IS THE LBL PROTOTYPE IMPLEMENTATION OF AN "EMPLOYMENT SERVICE
TABLE INDEPENDENT CELL SYSTEM" (ESTICS) FOR SUMMARY DATA.  THE DATA
STRUCTURE IS DESIGNED TO ALLOW CHANGES IN THE DATA INPUT AND REPORTING
OUTPUT REQUIREMENTS WITHOUT CHANGING THE COMPUTER PROGRAMS INVOLVED.  IT
IS ALSO DESIGNED TO ALLOW INTERACTIVE TOOLS, SUCH AS THIS PROGRAM
PROVIDES.
AT YOUR COMMAND.
*THE REST OF THE USER INPUT DECODED FOR THE "WHAT" COMMAND IS
*DEMONSTRATED AT VARIOUS POINTS IN THE SYNTAX BELOW.
SCAN
ENTER A LIST TO BE SCANNED OR "WHAT ARE LISTS?"
WHAT ARE LISTS?
THE LISTS WHICH MAY BE SCANNED VIA THE SCAN COMMAND ARE
CA        (CHARACTERISTICS OF APPLICANTS CELL LABELS)
--        (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
CJ        (CHARACTERISTICS OF JOB ORDERS CELL LABELS)
--
CE        (CHARACTERISTICS OF EMPLOYERS CELL LABELS)
--
AI        (ACTIVITY, COUNTING INDIVIDUALS CELL LABELS)
--
AT        (ACTIVITY, COUNTING TRANSACTIONS CELL LABELS)
--
OA        (OCCUPATIONAL CODES OF APPLICANTS CELL LABELS)
--
OJ        (OCCUPATIONAL CODES OF JOB ORDERS CELL LABLES)
--
CELLS     (THE DATA CELLS OF THE ENTIRE LBL-ESTICS DATABASE)
----
ENTER A LIST TO BE SCANNED OR "WHAT ARE LISTS?"
AI
ENTER SOME CHARACTERS TO BE SCANNED FOR OR "EXAMPLE."
EXAMPLE
THERE ARE 2 TYPES OF "SCANS," NAMELY
 1) FOR A CELL LABEL LIST YOU MAY ASK TO SEE ALL THOSE LABELS WHICH
    CONTAIN A WORD (OR WORDS) YOU SPECIFY, FOR EXAMPLE
    "SCAN AI COUNSEL" WOULD RESULT IN "MATCHES" WITH
    AI050 - AFTER COUNSELING
```

```
    AI105 - COUNSELING
    AI110 - COUNSELING INTERVIEWS
    AI115 - GROUP COUNSELING SESSIONS,
 2) FOR THE LBL-ESTICS CELLS YOU MAY ASK TO SEE ALL CELLS WHICH CONTAIN
    A LABEL CODE (OR CODES) YOU SPECIFY, FOR EXAMPLE
    "SCAN CELLS AI50, CA5" WOULD ATTEMPT TO TELL YOU WHICH CELLS, IF
    ANY, ARE IDENTIFIED BY THESE 2 LABELS.
 NOTES...
  - WORDS NEED NOT BE COMPLETE, BUT THEY MUST BE SPELLED CORRECTLY.
  - WORDS MAY BE IN ANY ORDER.
  - "WORDS" MAY CONTAIN NUMBERS, BUT NOT SPECIAL CHARACTERS
    (LIKE "$" OR .").
  - (SPECIAL CASE - IF YOU WANT TO KNOW THE TEXT CORRESPONDING TO
     LABEL AI50, YOU MAY ENTER "WHAT IS AI50.")
ENTER SOME CHARACTERS TO BE SCANNED FOR OR "EXAMPLE."
*PROGRAMMING NOTE--ALGORITHM FOR CRACKING SCAN COMMAND ARGUMENTS
* 1)IF THE 1ST 2 CHARACTERS IF THE 1ST ARGUMENT DO NOT MATCH WITH
*   A CELL LABEL, REPEAT THE 1ST PROMPT
* 2)IF THE 1ST 4 CHARACTERS OF THE 1ST ARGUMENT ARE "CELL,"
*   GO TO STEP 4
* 3)ALLOW UP TO 10 ARGUMENTS (BEGINNING WITH THE 2ND) AND ATTEMPT TO
*   MATCH THEM IN ANY ORDER. FOR EXAMPLE, "SCAN AI INTERV COUNS" WOULD
*   MATCH WITH "AI110 - COUNSELING INTERVIEWS"
*   (NOTE THAT THE ARGUMENTS 1) MAY BE PORTIONS OF WORDS AND 2) MAY NOT
*   CONTAIN NONALPHANUMERIC CHARACTERS)
*   (NOTE THAT THE LABEL CODE, SUCH AS "AI005," IS INCLUDED IN THE SCAN,
*    BUT THAT THE MATCH MUST BE COMPLETE, I.E., "AI" OR "5" WOULD
*    NOT MATCH WITH "AI005")
* 4)BEGINNING WITH THE 2ND ARGUMENT, ACCEPT UP TO 10 ARGUMENTS IN
*   LABEL FORM, NAMELY BEGINNING WITH THE 2 CHARACTERS
*   "CA," "CJ," "CE," "AI," "AT," "OA" OR "OJ" AND ENDING WITH 1 TO
*   9 NUMERALS.
*   IF AN ARGUMENT CANNOT BE UNDERSTOOD AS A LABEL, SAY SO AND REPEAT
*   THE 2ND PROMPT.  FOR EXAMPLE,
*   "SCAN CELLS AI005, CJ15, CA,5"
*   WOULD RESULT IN THE RESPONSE
*    "CA" NOT UNDERSTOOD AS A CELL LABEL
*    (YOU MIGHT WANT TO ASK "WHAT ARE LABELS?"
*    ENTER SOME CHARACTERS TO BE SCANNED FOR OR "EXAMPLE"
*
PLACEMENT
WILL SCAN FOR THE CHARACTERS...
PLACEMENT
THE RESULT OF THIS SCAN OR RESCAN IS 54 LINES LONG, DO YOU WANT TO SEE IT
*PROGRAMMING NOTE--IF THE RESULT OF A SCAN OR RESCAN IS 20 LINES OR
*LESS IGNOR THE OUTPUT CONTROL PROMPT.
NO
AT YOUR COMMAND.
RESCAN
ENTER SOME CHARACTERS TO BE RESCANNED FOR OR "EXAMPLE."
EXAMPLE
RESCAN SCANS THE OUTPUT OF THE LAST SUCCESSFUL SCAN OR RESCAN
COMMAND.  THEREFORE, NO "LIST" NEED BE SPECIFIED (AS THE SCAN COMMAND
REQUIRES). FOR EXAMPLE, IF YOU
"SCAN AI PLACEMENT"
```

```
YOU MIGHT DEVELOP A HUGE OUTPUT.  YOU COULD THEN
"RESCAN LOCAL"
TO ATTEMPT TO LIMIT THAT OUTPUT.  THE RESCAN CAN BE USED AS MANY
TIMES AS DESIRED TO LIMIT THE OUTPUT.  IF, AT ANY POINT,
"NO MATCH IS FOUND," THE OUTPUT AVAILABLE FOR RESCANNING DOES NOT
DISAPPEAR--IT REMAINS THE SAME AS IT WAS BEFORE THE
"UNSUCCESSFUL" RESCAN WAS DONE.
ENTER SOME CHARACTERS TO BE RESCANNED FOR OR "EXAMPLE."
FAT CHANCE
WILL RESCAN FOR THE CHARACTERS...
FAT CHANCE
NO MATCH WAS FOUND
AT YOUR COMMAND.
RESCAN INTERSTATE
WILL RESCAN FOR THE CHARACTERS...
INTERSTATE
AI020 PLACEMENTS, CLEARANCE, INTERSTATE
AI025 PLACEMENTS, INTERSTATE
AI030 PLACEMENTS, INTERSTATE, LOCAL
AT YOUR COMMAND.
OUTPUT
PLEASE ENTER "AREA" COMMAND FIRST.
AT YOUR COMMAND.
*BEFORE OUTPUT CAN BE GIVEN, AT LEAST ONE AREA, DATE AND CELL LABEL
*MUST BE EXPLICITLY SPECIFIED (THERE ARE DEFAULTS FOR "BREAKOUT" AND
*"TIME PERIOD").  PROMPT FOR THEM IN THE ORDER 1) AREA, 2) DATE AND
*3) LABEL UNTIL THEY ARE ALL GIVEN.
AREA
ENTER THE AREA TYPE WANTED OR "WHAT ARE AREA TYPES?"
WHAT ARE AREA TYPES?
NATION    (NATIONAL TOTAL)
--        (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
REGION    (FEDERAL REGION TOTAL)
--
STATE     (STATEWIDE)
--
SMSA      (STANDARD METROPOLITAN STATISTICAL AREA)
--
COUNTY    (COUNTY OF RESIDENCE)
--
ADMIN     (ADMINISTRATIVE DISTRICT)
--
LOCAL     (LOCAL OFFICE)
--
AS        (AREA OF STATE)
--
WIN       (WIN PROJECT)
--
ENTER THE AREA TYPE WANTED OR "WHAT ARE AREA TYPES?"
NATIONAL
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
AT YOUR COMMAND.
AREA
ENTER THE AREA TYPE WANTED OR "WHAT ARE AREA TYPES?"
```

```
REGION
ENTER THE NUMBER(S) OF THE FEDERAL REGION(S) WANTED OR "ALL"
*"ALL" WOULD MEAN THE USER WANTS ALL 10 FEDERAL REGIONS.
*(THIS MAY ALSO BE DONE WITH STATES.)
9
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
AT YOUR COMMAND.
AREA STATE
ENTER STATE(S) WANTED OR "WHAT ARE STATES?"
WHAT ARE STATES?
STATES MAY BE SPECIFIED BY NAME OR STANDARD 2 LETTER ABBREVIATION.
WOULD YOU LIKE A LIST?
YES
ALL FOR ALL STATES
--- (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
R8  FOR ALL STATES IN REGION VIII, ETC.
--
AL OR ALABAMA                  MT OR MONTANA
--    ----                     --    --
AK OR ALASKA                   NB OR NEBRASKA
--    ----                     --    ---
AZ OR ARIZONA                  NV OR NEVADA
--    ---                      --    ---
AR OR ARKANSAS                 NH OR NEW HAMPSHIRE
--    ---                      --    --- --
CA OR CALIFORNIA               NJ OR NEW JERSEY
--    --                       --    --- --
CO OR COLORADO                 NM OR NEW MEXICO
--    ---                      --    --- --
CT OR CONNECTICUT              NY OR NEW YORK
--    ---                      --    --- --
DE OR DELAWARE                 NC OR NORTH CAROLINA
--    --                       --    --    --
DC OR DISTRIC OF COLUMBIA      ND OR NORTH DAKOTA
--    --                       --    --    --
FL OR FLORIDA                  OH OR OHIO
--    --                       --    --
GA OR GEORGIA                  OK OR OKLAHOMA
--    --                       --    --
GU OR GUAM                     OR OR OREGON
--    --                       --    --
HI OR HAWAII                   PA OR PENNSYLVANIA
--    --                       --    --
ID OR IDAHO                    PR OR PUERTO RICO
--    --                       --    --
IL OR ILLINOIS                 RI OR RHODE ISLAND
--    --                       --    --
IN OR INDIANA                  SC OR SOUTH CAROLINA
--    --                       --    --    --
IA OR IOWA                     SD OR SOUTH DAKOTA
--    --                       --    --    --
KS OR KANSAS                   TN OR TENNESSEE
--    --                       --    ---
```

```
KY OR KENTUCKY                TX OR TEXAS
--    --                      --    ---
LA OR LOUISIANA               UT OR UTAH
--    --                      --    --
ME OR MAINE                   VT OR VERMONT
--    ---                     --    --
MD OR MARYLAND                VA OR VIRGINIA
--    ---                     --    --
MA OR MASSACHUSETTS           VI OR VIRGIN ISLANDS
--    ---                     --    --     --
MI OR MICHIGAN                WA OR WASHINGTON
--    ---                     --    --
MN OR MINNESOTA               WV OR WEST VIRGINIA
--    ---                     --    --   --
MS OR MISSISSIPPI             WI OR WISCONSIN
--    -----                   --    --
MO OR MISSOURI                WY OR WYOMING
--    -----                   --    --
ENTER STATE(S) WANTED OR "WHAT ARE STATES?"
MN, PENN
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
AT YOUR COMMAND.
*NOTE THAT MORE THAN 1 STATE OR REGION MAY BE SPECIFIED WITH A
*SINGLE AREA COMMAND.  THIS IS NOT TRUE WITH THE OTHER AREA TYPES.
AREA SMSA
ENTER SMSA WANTED OR "WHAT ARE SMSA'S?"
WHAT ARE SMSA'S?
SMSA'S MAY BE SPECIFIED BY NAME, FOR EXAMPLE
"AREA SMSA MEMPHIS" SPECIFIES THE ENTIRE MEMPHIS SMSA,
"AREA SMSA MEMPHIS, TENN" SPECIFIES THE TENNESSEE PORTION AND
"AREA SMSA MEMPHIS, 4" SPECIFIES THE REGION 4 (TN-MS) PORTION.
WOULD YOU LIKE A 3 PAGE LIST OF SMSA'S IN THE LBL-ESTICS DATABASE?
YES
(NUMBERS INDICATE FEDERAL REGION PORTIONS AVAILABLE.)
(STATE REQUESTS ARE EXPLAINED BY ENTERING "WHAT ARE STATES?")
AKRON, OHIO
-- (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
ALBANY-SCHENECTADY-TROY, NEW YORK
----
ALBUQUERQUE, NEW MEXICO
----
ALLENTOWN-BETHLEHEM-EASTON, PENNSYLVANIA-NEW JERSEY
---
ANAHEIM-SANTA ANA-GARDEN GROVE, CALIFORNIA
---
ANCHORAGE, ALASKA
---
ATLANTA, GEORGIA
--
BALTIMORE, MARYLAND
--
```

```
BILLINGS, MONTANA
---
BIRMINGHAM, ALABAMA
---
BOISE CITY, IDAHO
---
BOSTON, MASSACHUSETTS
---
BUFFALO, NEW YORK
---
BURLINGTON, VERMONT
---
CASPER, WYOMING
--
CHARLESTON, WEST VIRGINIA
------
CHARLOTTE-GASTONIA, NORTH CAROLINA
------
CHICAGO, ILLINOIS
--
CINCINNATI, OHIO(5)-KENTUCKY(4)-INDIANA(5)
--
CLEVELAND, OHIO
--
COLUMBIA, SOUTH CAROLINA
-------
COLUMBUS, OHIO
-------
DALLAS-FORT WORTH, TEXAS
---
DAYTON, OHIO
---
DENVER-BOULDER, COLORADO
---
DES MOINES, IOWA
---
DETROIT, MICHIGAN
---
FARGO-MOORHEAD, NORTH DAKOTA-MINNESOTA
--
FORT LAUDERDALE-HOLLYWOOD, FLORIDA
--
GARY-HAMMOND-EAST CHICAGO, INDIANA
--
GRAND RAPIDS, MICHIGAN
---
GREENSBORO--WINSTON-SALEM--HIGH POINT, NORTH CAROLINA
---
HARTFORD, CONNECTICUT
--
HONOLULU, HAWAII
---
HOUSTON, TEXAS
---
INDIANAPOLIS, INDIANA
```

```
--
JACKSON, MISSISSIPPI
--
JACKSONVILLE, FLORIDA
--------
JERSEY CITY, NEW JERSEY
--
KANSAS CITY, MISSOURI-KANSAS
--
LAS VEGAS, NEVADA
--
LITTLE ROCK-NORTH LITTLE ROCK, ARKANSAS
--
LOS ANGELES-LONG BEACH, CALIFORNIA
---
LOUISVILLE, KENTUCKY-INDIANA
---
MANCHESTER, NEW HAMPSHIRE
--
MEMPHIS, TENNESSEE(4)-ARKANSAS-MISSISSIPPI(4)
--
MIAMI, FLORIDA
---
MILWAUKEE, WISCONSIN
---
MINNEAPOLIS-ST. PAUL, MINNESOTA-WISCONSIN
---
NASHVILLE-DAVIDSON, TENNESSEE
----
NASSAU-SUFFOLK, NEW YORK
----
NEW ORLEANS, LOUISIANA
-- --
NEW YORK, NEW YORK-NEW JERSEY
--  --
NEWARK, NEW JERSEY
----
NORFOLK-VIRGINIA BEACH-PORTSMOUTH, VIRGINIA-NORTH CAROLINA
--
OKLAHOMA CITY, OKLAHOMA
--
OMAHA, NEBRASKA-IOWA
--
PATERSON-CLIFTON-PASSAIC, NEW JERSEY
--
PHILADELPHIA, PENNSYLVANIA-NEW JERSEY
---
PHOENIX, ARIZONA
---
PITTSBURGH, PENNSYLVANIA
--
PORTLAND, MAINE
--        ---
PORTLAND, OREGON-WASHINGTON
--
```

```
PROVIDENCE-WARWICK-PAWTUCKET, RHODE ISLAND-MASSACHUSETTS
--
RICHMOND, VIRGINIA
---
RIVERSIDE-SAN BERNARDINO-ONTARIO, CALIFORNIA
---
ROCHESTER, NEW YORK
--
SACRAMENTO, CALIFORNIA
--
ST. LOUIS, MISSOURI-ILLINOIS
--
SALT LAKE CITY-OGDON, UTAH
---
SAN ANTONIO, TEXAS
--  --
SAN DIEGO, CALIFORNIA
--  --
SAN FRANCISCO-OAKLAND, CALIFORNIA
--  --
SAN JOSE, CALIFORNIA
--  --
SAN JUAN, PUERTO RICO
--  --
SEATTLE-EVERETT, WASHINGTON
--
SIOUX FALLS, SOUTH DAKOTA
--
SPRINGFIELD-CHICOPEE-HOLYOKE, MASSACHUSETTS-CONNECTICUT
--
SYRACUSE, NEW YORK
--
TAMPA-ST. PETERSBURG, FLORIDA
--
TOLEDO, OHIO-MICHIGAN
--
WASHINGTON, DISTRIC OF COLUMBIA-MARYLAND-VIRGINIA
--
WICHITA, KANSAS
---
WILMINGTON, DELAWARE-NEW JERSEY-MARYLAND
---
YOUNGSTOWN-WARREN, OHIO
--
ENTER SMSA WANTED OR "WHAT ARE SMSA'S?"
DALLAS
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
5)  SMSA DALLAS-FORT WORTH, TEXAS
AT YOUR COMMAND,
AREA SMSA CINCINNATI
THE AREAS TO BE RETRIEVED FROM ARE
```

```
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
5)  SMSA DALLAS-FORT WORTH, TEXAS
6)  SMSA CINCINNATI, OHIO(5)-KENTUCKY(4)-INDIANA(5)
AT YOUR COMMAND.
AREA SMSA CINCI,KENT↑
AT YOUR COMMAND.
AREA SMSA CIN,5
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
5)  SMSA DALLAS-FORT WORTH, TEXAS
6)  SMSA CINCINNATI, OHIO(5)-KENTUCKY(4)-INDIANA(5)
7)  SMSA CINCINNATI, KENTUCKY PORTION
8)  SMSA CINCINNATI, REGION 5 PORTION
AT YOUR COMMAND.
AREA COUNTY
ENTER STATE WHICH CONTAINS THE COUNTY
CALIF
ENTER THE NUMERIC CODE FOR THE COUNTY WANTED OR "WHAT ARE CODES?"
WHAT ARE CODES?
NONSMSA SUBSTATE AREAS MAY BE SPECIFIED BY NUMERIC CODES AS FOLLOWS
(VIA THE "AREA" COMMAND)...
COUNTY OF RESIDENCE     - FEDERAL INFORMATION PROCESSING SYSTEM CODE
ADMINISTRATIVE DISTRICT - ?
LOCAL OFFICE            - ?
AREA OF STATE           - ? (CAN YOU HELP WITH THESE, D.C. FOLKS?)
WIN PROJECT             - ?
ENTER THE NUMERIC CODE FOR THE COUNTY WANTED OR "WHAT ARE CODES?"
13
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
5)  SMSA DALLAS-FORT WORTH, TEXAS
6)  SMSA CINCINNATI, OHIO(5)-KENTUCKY(4)-INDIANA(5)
7)  SMSA CINCINNATI, KENTUCKY PORTION
8)  SMSA CINCINNATI, REGION 5 PORTION
9)  COUNTY  13, STATE OF CALIFORNIA
AT YOUR COMMAND.
*NOTE THAT NUMERIC CODES WILL BE REQUIRED FOR THE SPECIFICATION
*OF ALL NONSMSA SUBSTATE AREAS BECAUSE IT IS NOT REASONABLE (?)
*TO KNOW ALL THE ENGLISH NAMES FOR THESE AREAS WHICH MIGHT BE
*INCLUDED IN THE ESARS DATABASE.
AREA LO CA 184
THE AREAS TO BE RETRIEVED FROM ARE
1)  THE NATION
2)  FEDERAL REGION 9
3)  MINNESOTA
4)  PENNSYLVANIA
```

```
5)  SMSA DALLAS-FORT WORTH, TEXAS
6)  SMSA CINCINNATI, OHIO(5)-KENTUCKY(4)-INDIANA(5)
7)  SMSA CINCINNATI, KENTUCKY PORTION
8)  SMSA CINCINNATI, REGION 5 PORTION
9)  COUNTY   13, STATE OF CALIFORNIA
10) LOCAL OFFICE  184, STATE OF CALIFORNIA
AT YOUR COMMAND.
*THE SYNTAX FOR THE REMAINING SUBSTATE AREA TYPES IS ANALOGOUS TO
*THAT FOR COUNTIES AND LOCAL OFFICES.  THAT IS, A STATE AND NUMERIC
*CODE MUST BE SPECIFIED.
OUTPUT
PLEASE ENTER "DATE" COMMAND FIRST.
DATE
ENTER DATE(S) WANTED OR "EXAMPLE."
EXAMPLE
"MAR76, JUN75-JUL74" SPECIFIES CELLS FOR MARCH, 1976, AND
JULY, 1974 THROUGH JUNE, 1975.
ENTER DATE(S) WANTED OR "EXAMPLE."
JUN76, DEC75
THE DATES TO BE RETRIEVED FROM ARE
1)  JUNE,      1976
2)  DECEMBER,  1975
AT YOUR COMMAND.
DATE JUN75-AUG75
THE DATES TO BE RETRIEVED FROM ARE
1)  JUNE,      1976
2)  DECEMBER,  1975
3)  JUNE,      1975
4)  JULY,      1975
5)  AUGUST,    1975
AT YOUR COMMAND.
*PROGRAMMING NOTE--ALGORITHM FOR DECODING DATES...
*  1) REQUIRE MONTH/YEAR PAIRS TO HAVE NO DELIMITERS BETWEEN
*     MONTH AND YEAR
*  2) CHECK 1ST 3 CHARS ONLY FOR THE MONTH
*  3) CHECK LAST CHAR ONLY FOR THE YEAR,
*  4) ALLOW DASH AS SPECIAL DELIMITER INDICATING A RANGE OF DATES.
*THIS IMPLIES THAT ENTRIES LIKE "JULY, 1976" AND "FB6" WILL NOT BE
*UNDERSTOOD.  IF THIS PROVES TO BE A PROBLEM WE CAN EXPAND THE
*ALGORITHM LATER.
OUTPUT
PLEASE ENTER "LABEL" COMMAND FIRST.
LABEL
ENTER LABEL(S) WANTED OR "WHAT ARE LABELS?"
WHAT ARE LABELS?
LABELS IDENTIFY THE CONTENT OF THE CELLS WANTED (AS OPPOSED TO THE DATE,
AREA, BREAKOUT AND TIME PERIOD).  THE LABELS HAVE BEEN LOGICALLY DIVIDED
INTO VARIOUS "CHARACTERISTIC," "ACTIVITY" AND "OCCUPATION" LABELS.  ANY
NUMBER OF LABELS MAY THEORETICALLY IDENTIFY A CELL AS LONG AS ONE, AND
ONLY ONE, IS AN ACTIVITY LABEL.  WOULD YOU LIKE TO SEE SOME EXAMPLES?
YES
"AI005" SPECIFIES THE CELL CONTAINING TOTAL PLACEMENTS, COUNTING
 INDIVIDUALS, NOT TRANSACTIONS.
"AT005" SPECIFIES THE CELL CONTAINING TOTAL PLACEMENTS, COUNTING
 TRANSACTIONS, NOT INDIVIDUALS.
```

```
"CA005,AI005" SPECIFIES THE CELL CONTAINING TOTAL PLACEMENTS OF
 PEOPLE UNDER 20, COUNTING INDIVIDUALS.
"CA005,AI005,CJ005" SPECIFIES THE CELL CONTAINING TOTAL PLACEMENTS OF
 PEOPLE UNDER 20 IN NONAGRICULTURAL INDUSTRIES, COUNTING INDIVIDUALS.

THE CODES FOR DESIRED LABELS MAY BE OBTAINED VIA THE SCAN COMMAND.  ALSO,
THE LABELS OF THE CELLS AVAILABLE IN THE LBL-ESTIC DATABASE MAY BE SEEN
VIA THE SCAN COMMAND. FOR INSTANCE, IF YOU SCANNED THE "ACTIVITY CELL
LABELS, COUNTING INDIVIDUALS" FOR THE CHARACTERS "COUNSEL" YOU WOULD FIND
THE FOLLOWING LABELS CONTAIN THOSE CHARACTERS...
AI050 - AFTER COUNSELING
AI105 - COUNSELING
AI110 - COUNSELING INTERVIEWS
AI115 - GROUP COUNSELING SESSIONS.
YOU COULD THEN SCAN THE "CELLS" OF THE DATABASE FOR THE CHARACTERS "AI110"
TO FIND WHICH CELLS CONTAIN THAT LABEL.  (NOTE THAT CELLS WHICH HAVE BEEN
PRODUCED AT SOME TIME BY SOME AREA, WHICH IS WHAT THE SCAN TELLS YOU, MAY
NOT BE PRODUCED BY ANY PARTICULAR SUBBLOCK.  FOR INSTANCE, THE CELL MAY
ONLY BE PRODUCED QUARTERLY AND YOUR SUBBLOCK OF INTEREST MAY BE FOR A
NONQUARTERLY MONTH.)
ENTER LABEL(S) WANTED OR "WHAT ARE LABELS?"
AI005
THE CELLS TO BE RETRIEVED ARE LABELED
1)  AI005 PLACEMENTS, TOTAL
AT YOUR COMMAND.
LABEL CA5, CJ5, AI5
THE CELLS TO BE RETRIEVED FROM ARE LABELED
1)  AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS
2)  CA005 AGE, UNDER 20
    CJ015 NONAGRICULTURAL INDUSTRIES
    AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS
AT YOUR COMMAND.
*PROGRAMMING NOTE--ALGORITHM FOR CRACKING LABELS.
* 1)1ST 2 CHARACTERS MUST BE VALID LABEL LIST
* 2)LAST 1 TO 3 CHARACTERS MUST BE NUMERIALS
*   (ZERO FILL IS OK, BUT NOT NECESSARY)
*
*AT THIS POINT IN THE SESSION AT LEAST ONE AREA, DATE AND CELL HAVE
*BEEN SPECIFIED SO THE "OUTPUT" COMMAND SHOULD FINALLY GIVE US SOME
*RESULTS.  (REMEMBER THAT IF NO "BREAKOUTS" ARE SPECIFIED, "ALL
*APPLICANTS" IS ASSUMED TO BE WANTED AND IF NO "PERIODS" ARE SPECIFIED,
*"FISCAL YEAR TO DATE" IS ASSUMED TO BE WANTED.)
OUTPUT
DO YOU WANT A "NARROW" (72 CHARS) OR "WIDE" (130 CHARS) OUTPUT?
*ONCE THIS IS SPECIFIED BY A USER, ALLOW THEM TO SUPPRESS THE
*MESSAGE ("OUTPUT↑").
*DECODE USER ENTRY BY ACCEPTING ONLY A "WI" OR "NA" AS THE 1ST 2
*ALPHANUMERIC CHARACTERS THEY ENTER.
NARROW
DO YOU WANT AREAS ACROSS THE TOP ("NO" WILL GET YOU DATES INSTEAD)?
*IF THE USER ENTERS THIS ARGUMENT WITHOUT BEING PROMPTED FOR IT,
*ALLOW EITHER "AR" OR "DA" (FOR AREAS AND DATES RESPECTIVELY) AS
*WELL AS YES OR NO (DECODE THE USUAL WAY). FOR EXAMPLE EITHER
* "OUTPUT,NARROW,NO" OR
* "OUTPUT,NARROW,DATES"
```

*WOULD BE OK FOR SPECIFYING DATES ACROSS THE TOP OF THE OUTPUT.
*
*ALSO ALLOW SUPPRESSION, AS ABOVE (WITH WIDTH SPECIFICATION).
YES

****
LBL-ESTICS OUTPUT (05 JAN 77)
****

(THE TIME PERIOD COVERED BY THESE CELLS IS "FISCAL YEAR TO DATE.")

ALL APPLICANTS	.THE NATION	.FEDERAL REGION 9	.MINNESOTA	.PENNSYLVANI. A
**********				
AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS				
**********				
JUNE, 1976	.987,654,321.	87,654,321.	54,321.	654,321.
DECEMBER, 1975	. 87,654,321.	7,654,321.	4,321.	54,321.
JUNE, 1975	.987,654,321.	87,654,321.	4,321.	54,321.
JULY, 1975	.987,654,321.	87,654,321.	4,321.	654,321.
AUGUST, 1975	. 87,654,321.	87,654,321.	54,321.	54,321.
**********				
CA005 AGE, UNDER 20				
CJ015 NONAGRICULTURAL INDUSTRIES				
AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS				
**********				
JUNE, 1976	.987,654,321.	87,654,321.	54,321.	321.
DECEMBER, 1975	. 87,654,321.	7,654,321.	4,321.	4,321.
JUNE, 1975	. 87,654,321.	7,654,321.	4,321.	4,321.
JULY, 1975	. 87,654,321.	7,654,321.	54,321.	4,321.
AUGUST, 1975	. 87,654,321.	7,654,321.	4,321.	321.

ALL APPLICANTS	.SMSA DALLAS-FORT. WORTH, TEXAS	.SMSA CINCINNATI, OHIO-KENTUCKY-INDIANA, REGION 4 (KY)-REGION. 5 (IN-OH)	.SMSA CINCINNATI, KENTUCKY PORTION	.SMSA CINCINNATI, REGION 5 PORTION (INDIANA-OHIO)
**********				
AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS				
**********				
JUNE, 1976	. 7,654,321.	7,654,321.	54,321.	654,321.
DECEMBER, 1975	. 7,654,321.	7,654,321.	54,321.	654,321.
JUNE, 1975	. 7,654,321.	7,654,321.	54,321.	654,321.
JULY, 1975	. 7,654,321.	7,654,321.	54,321.	654,321.

```
       AUGUST,    1975 .  7,654,321.  7,654,321.      54,321.     654,321.
************************
CA005 AGE, UNDER 20
CJ015 NONAGRICULTURAL INDUSTRIES
AI005 PLACEMENTS, TOTAL, COUNTING INDIVIDUALS
************************
       JUNE,      1976 .  7,654,321.  7,654,321.      54,321.     654,321.
       DECEMBER,  1975 .  7,654,321.  7,654,321.      54,321.     654,321.
       JUNE,      1975 .  7,654,321.  7,654,321.      54,321.     654,321.
       JULY,      1975 .  7,654,321.  7,654,321.      54,321.     654,321.
       AUGUST,    1975 .  7,654,321.  7,654,321.      54,321.     654,321.
-------------------------------------------------------------------------------


AT YOUR COMMAND.
*PROGRAMMING NOTES ON THE FORM OF THE OUTPUT--THE MAIN PURPOSE OF THIS
*PROGRAM IS TO QUICKLY AND EASILY RETRIEVE INFORMATION, NOT TO PRODUCE
*REPORTS.  THEREFORE, USERS WILL BE GIVEN LITTLE CONTROL OVER THE FORMAT
*OF THE OUTPUT (THEY MAY, HOWEVER, EXPLICITLY SPECIFY THE WIDTH AND
*WHETHER THEY WANT AREAS OR DATES ACROSS THE TOP OF THE OUTPUT; THEY MAY
*ALSO IMPLICITLY SPECIFY THE ORDER OF AREAS, DATES AND CELLS).
*"GENERALIZED REPORT PRODUCTION" WILL
*BE ADDRESSED BY ANOTHER PROGRAM AS A LOGICALLY
*SEPARATE ENDEAVOR.
*
*THE ABOVE EXAMPLE OUTPUT IS DESIGNED TO DEMONSTRATE A DEFAULT FORM
*WHICH WILL WORK FOR ALL COMBINATIONS OF AREAS, DATES, CELLS AND
*BREAKOUTS. (IF MULTIPLE BREAKOUTS ARE SPECIFIED, CYCLE THROUGH THE
*ABOVE FORM FOR EACH BREAKOUT.)
*
*THE SUBJECT OF DATA ITEMS WHICH AREN'T AVAILABLE IS ADDRESSED IN THE
*SYNTAX BELOW.
*
REAREA
ENTER THE AREA TYPE WANTED OR "WHAT ARE AREA TYPES?"
*ALL THE "RE" COMMANDS (EXCEPT RESCAN) WORK THE SAME IN THAT THEY
*"WIPE OUT" ANY AREAS, DATES, LABELS OR BREAKOUTS SPECIFIED BY THE
*PARENT COMMAND AND THEN REVERT TO THE SAME SYNTAX AS THE PARENT
*COMMAND. (THERE IS NO "REPERIOD" COMMAND BECAUSE ONLY ONE TIME PERIOD AT
*A TIME MAY BE SPECIFIED.)
STATE NEW MEX
THE AREAS TO BE RETRIEVED FROM ARE
1)  NEW MEXICO
AT YOUR COMMAND.
*THE DATES AND CELLS SPECIFIED BEFORE STILL APPLY.
*
*UP TO THIS POINT IN THE SYNTAX EVERYTHING HAS "GONE OK."  THAT IS,
*ALL USER ENTRIES HAVE BEEN SUCCESSFULLY DECODED, THE PROGRAM HAS NOT
*"BLOWN UP," DATA FOR ALL AREAS, DATES, CELLS, BREAKOUTS AND PERIODS
*SPECIFIED HAVE BEEN PRESENT, AND SO ON.  NOW CONSIDER THE SYNTAX
*WHEN THINGS "GO WRONG."
UNKNOWN COMMAND
COMMAND NOT UNDERSTOOD, YOU MAY ENTER "WHAT ARE COMMANDS?"
```

```
2ND UNKNOW COMMAND IN A ROW
COMMAND NOT UNDERSTOOD, PLEASE ENTER ONE OF THE FOLLOWING COMMANDS
   (GIVE COMMAND LIST JUST AS THOUGH USER HAD REQUESTED IT)
AT YOUR COMMAND.
*CLEAR ALL EXPLICIT SPECIFICATIONS TO THIS POINT
REAREA↑
AT YOUR COMMAND.
REDATE↑
AT YOUR COMMAND.
RELABEL↑
AT YOUR COMMAND.
*AS FAS AS THE PROGRAM IS CONCERNED, THE USER HAS NEVER SPECIFIED ANY
*AREAS, DATES OR LABELS AT THIS POINT.
AREA STATE TYPO
STATE NAMED "TYPO" CANNOT BE FOUND.
ENTER STATE(S) WANTED OR "WHAT ARE STATES?"
*WHENEVER AN ARGUMENT CAN'T BE DECODED, REVERT TO THE APPROPRIATE
*PROMPT.
AREA TYPO ALASKA
AREA TYPE "TYPO" CANNOT BE FOUND.
ENTER THE AREA TYPE WANTED OR "WHAT ARE AREA TYPES?"
STATE
ENTER STATE(S) WANTED OR "WHAT ARE STATES?"
*NOTE THAT THE STATE NAME WAS NOT REMEMBERED, EVEN THOUGH IT WAS
*PREVIOUSLY ENTERED AS THE 3RD ARGUMENT.  IN GENERAL, THEN, FOR ANY
*COMMAND,
* 1)THE ORDER OF THE ARGUMENTS IS SIGNIFICANT
* 2)WHEN AN ARGUMENT CAN'T BE DECODED THE APPROPRIATE PROMPT IS
*   GIVEN
* 3)ANY ARGUMENTS WHICH WOULD NORMALLY BE UNDERSTOOD ARE "FORGOTTEN" IF
*   PRECEEDED BY AN NONUNDERSTOOD ARGUMENT.
* 4)ANY NUMBER OF REMAINING COMMAND ARGUMENTS MAY BE GIVEN INITIALLY
*   OR AT ANY TIME DURING A PROMPTING SEQUENCE
*
*IN GENERAL USERS WILL BE TOLD IF PARTICULAR COMBINATIONS OF AREAS,
*DATES, LABELS, BREAKOUTS AND PERIODS WHICH THEY REQUEST ARE NOT
*PRESENT AS SOON AS POSSIBLE, NOT JUST WHEN THEY COMMAND "OUTPUT."
*THIS IS DONE TO
* 1)TELL USERS WHAT IS IN THE DATABASE IRRESPECTIVE OF ACTUAL RETRIEVALS
*   FOR EXAMPLE, USERS MIGHT WISH TO KNOW WHICH, IF ANY, REGIONAL
*   TOTALS EXIST FOR FY75 OR FOR WHICH MONTHS NATIONAL TOTALS EXIST
*   BEFORE THEY THINK ABOUT PARTICULAR DATA TO REQUEST (THIS IDEA
*   APPEARS TO CONFORM TO HUMAN THOUGHT PATTERNS),
* 2)HELP PREVENT UNWANTED RETRIEVALS WHICH TAKE USER TIME AND MONEY.
*LISTED BELOW ARE THE POSSIBLE REASONS THAT MAY BE GIVEN TO USERS
*FOR THE ABSENSE OF A SUBBLOCK, OR CELL WITHIN A SUBBLOCK AS THEY GO
*ABOUT SPECIFYING AREAS, DATES, LABELS, BREAKOUTS AND PERIODS IN ANY
*ORDER THEY WISH (THE SOURCE OF THIS INFORMATION IS THE BDMS CELL
*DICTIONARY, UNLESS INDICATED BY "INTERAC INDEX")...
* 1)AREA
*    A)NONEXISTANT AREA CODE
*    B)AREA CODE NEVER ENTERED INTO LBL DATABASE
*      (CAN'T TELL IF IT'S (A) OR (B) - INTERAC INDEX)
* 2)DATE
*    A)FUTURE DATE
```

```
*     B)DATE PREVIOUS TO LBL DATABASE FORMATION
*  3)LABEL
*     A)NONEXISTANT LABEL
*     B)NONEXISTANT CELL AS LABELED
*  4)AREA AND DATE
*     AREA NOT ENTERED IN LBL DATABASE FOR DATE SPECIFIED BECAUSE
*       - IT WAS NEVER PRODUCED,
*       - IT HASN'T BEEN RECEIVED AT LBL OR
*       - IT HASN'T YET BEEN PLACED IN THE LBL DATABASE
*         (CAN'T TELL WHICH - INTERAC INDEX)
*  5)LABEL AND AREA
*     CELL NOT PRODUCED FOR AREA TYPE SPECIFIED
*  6)LABEL AND DATE
*     A)CELL NOT PRODUCED DURING DATE SPECIFIED
*     B)CELL NOT PRODUCED FOR DATE SPECIFIED BECAUSE OF FREQUENCY
*  7)LABEL AND BREAKOUT
*     CELL NOT PRODUCED FOR BREAKOUT SPECIFIED
*  8)LABEL AND PERIOD
*     CELL NOT PRODUCED FOR TIME PERIOD SPECIFIED
*  9)LABEL AND DATE AND BREAKOUT
*     A)CELL NOT PRODUCED FOR BREAKOUT SPECIFIED DURING DATE SPECIFIED
*     B)CELL NOT PRODUCED FOR BREAKOUT AND DATE SPECIFIED BECAUSE
*       OF FREQUENCY
*  10)LABEL AND DATE AND PERIOD
*      (SAME AS 9 (A) AND (B) WITH "PERIOD" SUBSTITUTED FOR "BREAKOUT")
*  11)LABEL AND DATE AND AREA
*      (SAME AS 10 (A) AND (B) WITH "AREA" SUBSTITUTED FOR "BREAKOUT")
*
*IF NONE OF THESE MESSAGES ARE GIVEN IT MEANS THAT APPARENTLY THE SUBBLOCK
*EXISTS AND THAT IT IS OK FOR A REQUESTED CELL TO HAVE BEEN PRODUCED FOR
*THE AREA CODE, FREQUENCY, BREAKOUT AND TIME PERIOD SPECIFIED.  IF
*THE CELL IS NOT FOUND IN THE SUBBLOCK IT IS BECAUSE
*  1)IT WAS NEVER PRODUCED BECAUSE
*     A)IT WAS NOT FEDERALLY REQUIRED AND THE ES AGENCY RESPONSIBLE
*       CHOSE NOT TO PRODUCE IT,
*     B)THERE WAS AN ES PROCESSING ERROR,
*  2)THERE WAS A LBL PROCESSING ERROR.
*
*THE ACTUAL SYNTAX TO OFFER THESE REASONS FOLLOWS
**********
*MESSAGE 1 (AREA ALONE)
**********
AREA COUNTY CALIF 150
THE AREAS TO BE RETRIEVED FROM ARE
1)  NEW MEXICO
2)  COUNTY  150, CALIFORNIA
COUNTY "150" IN THE STATE OF CALIFORNIA CANNOT BE FOUND IN THE
LBL-ESTICS DATABASE...ARE YOU CERTAIN OF THE CODE?
YES
IF THE CODE IS ACCURATE IT MAY BE THAT THIS AREA HAS NOT BEEN ENTERED
INTO THE LBL-ESTICS DATABASE. IF YOU THINK IT HAS OR IF YOU THINK
IT SHOULD BE, PLEASE CONTACT GINNY (OR ENTER "WHO IS GINNY?").
AT YOUR COMMAND.
*BECAUSE THE USER ANSWERED IN THE AFFIRMATIVE THAT THE AREA CODE WAS
*ACCURATE, ALLOW IT IN THE LIST SO IT WILL BE REFLECTED AS A -NF-
```

```
*(FOR "NOT FOUND").
*ITEM IN ANY ACTUAL OUTPUT (MAYBE THEY WANT TO SHOW THAT IT IS NOT
*AVAILABLE!).
AREA REGION 6
THE AREAS TO BE RETRIEVED FROM ARE
1)  NEW MEXICO
2)  COUNTY  150, CALIFORNIA
3)  FEDERAL REGION 6
AT YOUR COMMAND.
**********
MESSAGE 2
**********
REDATE JUN52 & DEC77
JUNE, 1952 IS BEFORE THE JULY, 1973, DEVELOPMENT OF ESTICS.
DECEMBER, 1977, IS IN THE FUTURE.
ENTER DATE(S) WANTED OR "EXAMPLE".
*THE DEVELOPMENT DATE OF ESTICS IS BUILT INTO THE PROGRAM.  THE FUTURE
*DATE IS DETERMINED BY CHECKING THE YEAR AND MONTH OF THE SESSION (IN
*THIS EXAMPLE IT'S JAN77).  NOTE THAT THESE DATES ARE NOT ACCEPTED UNDER
*ANY CIRCUMSTANCES!  IF NO DATES HAVE BEEN ACCEPTED GIVE THE PROMPT,
*OTHERWISE LIST THE DATES AND SAY "AT YOUR COMMAND."
**********
*MESSAGE 4
**********
APR76-JUN76  GARBAGE
THE DATES TO BE RETRIEVED FROM ARE
1)  APRIL,     1976
2)  MAY,       1976
3)  JUNE,      1976
"GARBAGE" WAS NOT UNDERSTOOD AS A DATE.
FEDERAL REGION 6 FOR APRIL AND MAY, 1976, CANNOT BE FOUND BECAUSE
 1)IT WAS NEVER PRODUCED,
 2)IT HASN'T BEEN RECEIVED AT LBL OR
 3)IT HASN'T BEEN PLACED IN THE LBL-ESTICS DATABASE.
AT YOUR COMMAND.
**********
*MESSAGE 3A
**********
LABEL CA056, AI40
LABEL "CA056" CANNOT BE FOUND...ARE YOU CERTAIN THIS LABEL EXISTS?
YES
PLEASE CONTACT GINNY (OR ENTER "WHO IS GINNY?")
AT YOUR COMMAND.
*NOTE THAT IT DOES NOT MAKE SENSE TO ALLOW THIS CELL AS LABELED.
**********
*MESSAGE 3B
**********
LABEL CA65,AI40
NO CELL CAN BE FOUND LABELED
CA065 FEMALE
AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
ARE YOU CERTAIN SUCH A CELL HAS BEEN DEFINED?
YES
PLEASE CONTACT GINNY (OR ENTER "WHO IS GINNY?")
THE CELLS TO BE RETRIEVED FROM ARE
```

```
1)  CA065 FEMALE
    AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
AT YOUR COMMAND.
*ALLOW THIS CELL TO BE ON THE SPECIFICATION LIST FOR THE SAME REASON
*CALIFORNIA COUNTY 150 IS ALLOWED ON THE AREA LIST (SEE ABOVE).
**********
*MESSAGES 5 & 6
**********
LABEL CA065 AI095
THE CELLS RETRIEVED ARE LABELED
1)  CA065 FEMALE
    AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
2)  CA065 FEMALE
    AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
          INDIVIDUALS
CELL 2 WAS NOT PRODUCED DURING APRIL OR MAY, 1976.  IT WAS PRODUCED
FROM JUNE, 1976, TO THE PRESENT ON A "MONTHLY" FREQUENCY.
CELL 2 WAS NOT PRODUCED FOR COUNTIES.  IT WAS PRODUCED FOR NATIONAL,
REGIONAL AND STATEWIDE AREA TYPES.
AT YOUR COMMAND.
*NOTE THAT
* 1)THE INFORMATION ABOUT CELL 1 NOT BEING FOUND WAS NOT REPEATED;
*   THIS SHOULD BE A GENERAL RULE.
* 2)MORE THAN ONE MESSAGE CAN BE APPROPRIATE AT ONE TIME.  IN THIS CASE
*   SPECIFICATION OF A CELL'S LABELS ENABLED MESSAGES ABOUT PREVIOUSLY
*   SPECIFIED DATES AND AREAS.
BREAKOUT
ENTER BREAKOUT(S) WANTED OR "WHAT ARE BREAKOUTS?"
WHAT ARE BREAKOUTS?
"BREAKOUTS" ARE DIVISIONS OF PEOPLE BY FUNDAMENTAL CHARACTERISTICS;
THEY MAY BE SPECIFIED WITH THE "BREAKOUT" COMMAND.  IF NO SPECIFICATION
IS MADE, "ALL INDIVIDUALS" IS ASSUMED.
 ALL APPLICANTS
 -- (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
 ECONOMICALLY DISADVANTAGED
 --
 MINORITY
 --
 VETERAN
 --
 UI CLAIMANT
 --
 WIN
 --
 FOOD STAMP
 --
 MANDATORY LISTING
 --
 ES GRANTS
 --
 JOB OPENINGS OR ORDERS (ALL)
 --
ENTER BREAKOUT(S) WANTED OR "WHAT ARE BREAKOUTS?"
```

```
**********
*MESSAGE 7
**********
VETS
THE CELLS ARE TO BE BROKEN OUT BY
1) VETERANS
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR THE BREAKOUT "VETERANS."  IT WAS PRODUCED FOR
"ALL INDIVIDUALS" AND "MINORITY."
AT YOUR COMMAND.
*NOTE THAT ANY VALID BREAKOUT SPECIFICATION IS ACCEPTABLE REGARDLESS
*OF WHETHER ANY CELLS SPECIFIED TO THAT POINT SATISFY THE SPECIFICATION.
*NOTE ALSO THAT ONCE A BREAKOUT SPECIFICATION IS MADE, ALL APPLICANTS
*IS NO LONGER ASSUMED AS A BREAKOUT.
PERIOD
ENTER TIME PERIOD WANTED OR "WHAT ARE PERIODS?"
WHAT ARE PERIODS?
"PERIODS" ARE THE TIME PERIODS COVERED BY A CELL; ONE MAY BE SPECIFIED
WITH THE "PERIOD" COMMAND.  IF IT IS NOT SPECIFIED "FISCAL YEAR TO
DATE" IS ASSUMED
 MONTH
 --    (DASHES INDICATE THE MINIMUM CHARACTERS WHICH MAY BE ENTERED.)
 MIDDLE MONTH OF QUARTER (AS OF END OF)
 --
 QUARTER
 --
 7 DAYS      (SELECTED TIME PERIOD - 1ST 7 DAYS)
 -
 1ST MONTH   (SELECTED TIME PERIOD - 1ST MONTH)
 -
 END         (SELECTED TIME PERIOD - END OF QUARTER)
 --
 FISCAL YEAR TO DATE
 --
 CUMULATIVE APRIL 1 THROUGH SEPTEMBER 30
 --
ENTER TIME PERIOD WANTED OR "WHAT ARE PERIODS?"
**********
*MESSAGES 8 & 10
**********
MONTH
THE CELL LABELED
 CA065 FEMALE
 AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
IS NOT PRODUCED FOR THE TIME PERIOD "MONTH."  IT IS PRODUCED FOR THE
TIME PERIODS "QUARTER" AND "FISCAL YEAR TO DATE."
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR THE TIME PERIOD "MONTH" DURING APRIL AND MAY,
1976.  IT IS PRODUCED FOR THE TIME PERIOD "MONTH" FROM JUNE, 1976,
```

TO PRESENT ON A "MONTHLY" FREQUENCY AND FOR THE TIME PERIOD "FISCAL YEAR TO DATE" FROM SEPTEMBER, 1975, TO PRESENT ON A "QUARTERLY" FREQUENCY.
THE TIME PERIOD OF THE CELLS TO BE RETRIEVED IS "MONTH."
AT YOUR COMMAND.
*NOTE THAT WHEN A CELL IS NOT PRODUCED FOR A SPECIFIC PARAMETER,
*ALL APPROPRIATE PARAMETERS OF THAT TYPE FOR WHICH THE CELL IS
*PRODUCED ARE GIVEN.
****
*MESSAGE 9
****
BREAKOUT MINORITY
THE CELLS ARE TO BE BROKEN OUT BY
1) VETERANS
2) MINORITY
THE CELL LABELED
CA065 FEMALE
AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING INDIVIDUALS
WAS NOT PRODUCED FOR THE BREAKOUT "MINORITY" DURING APRIL AND MAY, 1976.
IT WAS PRODUCED FOR THE BREAKOUTS "ALL APPLICANTS" AND "MINORITY" FROM SEPTEMBER, 1975, TO PRESENT ON A "QUARTERLY" FREQUENCY.
AT YOUR COMMAND.
****
*MESSAGE 11
****
AREA LOCAL OFFICE
THE CELL LABELED
CA065 FEMALE
AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING INDIVIDUALS
WAS NOT PRODUCED FOR THE "LOCAL OFFICE" AREA TYPE DURING APRIL AND MAY, 1976. IT WAS PRODUCED FOR THE "NATIONAL," "REGIONAL," "STATEWIDE," "SMSA" AND "LOCAL OFFICE" AREA TYPES FROM SEPTEMBER, 1977, TO THE PRESENT ON A "QUARTERLY FREQUENCY."
STATE NAMED "OFFICE" NOT UNDERSTOOD.
ENTER STATE WHICH CONTAINS THE LOCAL OFFICE.
OUTPUT, NARROW, DATES

****
LBL-ESTICS OUTPUT (05 JAN 77)
****

(THE TIME PERIOD COVERED BY THESE CELLS IS "MONTH.")

VETERANS	.APRIL, 1976.	.MAY, 1976	.JUNE, 1976 .
**********			
CA065 FEMALE			
AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS			

```
**************************
 NEW MEXICO            .    -NF-    .    -NF-    .    -NF-    .
 COUNTY  150,          .            .            .            .
  CALIFORNIA           .    -NF-    .    -NF-    .    -NF-    .
 FEDERAL REGION 6      .    -NF-    .    -NF-    .    -NF-    .
**************************
CA065 FEMALE
AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
      INDIVIDUALS
**************************
 NEW MEXICO            .    -NF-    .    -NF-    .    -NF-    .
 COUNTY  150,          .            .            .            .
  CALIFORNIA           .    -NF-    .    -NF-    .    -NF-    .
 FEDERAL REGION 6      .    -NF-    .    -NF-    .    -NF-    .

-------------------------------------------------------------
MINORITY              .APRIL, 1976.MAY, 1976  .JUNE, 1976 .
----------------------.-----------.-----------.-----------.
**************************
LATER
CA065 FEMALE
AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
**************************
 NEW MEXICO            .    -NF-    .    -NF-    .    -NF-    .
 COUNTY  150,          .            .            .            .
  CALIFORNIA           .    -NF-    .    -NF-    .    -NF-    .
 FEDERAL REGION 6      .    -NF-    .    -NF-    .    -NF-    .
**************************
CA065 FEMALE
AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
      INDIVIDUALS
**************************
 NEW MEXICO            .    -NF-    .    -NF-    .     54,321.
 COUNTY  150,          .            .            .            .
  CALIFORNIA           .    -NF-    .    -NF-    .    -NF-    .
 FEDERAL REGION 6      .    -NF-    .    -NF-    .    -NF-    .
-------------------------------------------------------------


*************************************************
FOOTNOTES EXPLAINING THOSE CELLS NOT FOUND (-NF-)
*************************************************

 COUNTY "150" IN THE STATE OF CALIFORNIA COULD NOT BE FOUND IN THE LBL
 DATABASE (IF YOU BELIEVE THE CODE IS ACCURATE AND THAT IT SHOULD BE IN
 THE DATABASE CONTACT GINNY)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 A CELL LABELED
  CA065 FEMALE
  AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
 COULD NOT BE FOUND IN THE LIST OF CELLS DEFINED FOR THE ESTICS DATABASE.
 IF YOU BELIEVE SUCH A CELL HAS BEEN DEFINED, CONTACT GINNY.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 FEDERAL REGION 6 FOR APRIL AND MAY, 1976, COULD NOT BE FOUND BECAUSE
```

```
 1)IT WAS NEVER PRODUCED,
 2)IF SO, IT HASN'T BEEN RECEIVED AT LBL OR
 3)IF SO, IT HAN'T YET BEEN PLACE IN THE LBL DATABASE.
IF YOU BELIEVE IT'S NUMBER 3, CONTACT GINNY.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR "COUNTIES."  IT WAS PRODUCED FOR "NATIONAL,"
"REGIONAL" AND "STATEWIDE" AREA TYPES.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED DURING APRIL OR MAY, 1976.  IT WAS PRODUCED FROM
JUNE, 1976, TO THE PRESENT ON A "MONTHLY" FREQUENCY.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR THE BREAKOUT "VETERANS." IT WAS PRODUCED FOR
"ALL APPLICANTS" AND "MINORITY."
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI040 PLACEMENTS, AFTER TRAINING, COUNTING INDIVIDUALS
IS NOT PRODUCED FOR THE TIME PERIOD "MONTH."  IT IS PRODUCED FOR THE
TIME PERIODS "QUARTER" AND "FISCAL YEAR TO DATE."
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR THE BREAKOUT "MINORITY" DURING APRIL AND MAY,
1976. IT WAS PRODUCED FOR THE BREAKOUTS "ALL APPLICANTS" AND
"MINORITY" FROM SEPTEMBER, 1975, TO PRESENT ON A "QUARTERLY"
FREQUENCY.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
THE CELL LABELED
 CA065 FEMALE
 AI095 PLACEMENTS, AVAILABLE APPLICANTS, REGISTERED, COUNTING
       INDIVIDUALS
WAS NOT PRODUCED FOR THE TIME PERIOD "MONTH" DURING APRIL AND MAY,
1976.  IT IS PRODUCED FOR THE TIME PERIOD "MONTH" FROM JUNE, 1976, TO
THE PRESENT ON A "MONTHLY" FREQUENCY AND FROM SEPTEMBER, 1975, TO
PRESENT ON A "QUARTERLY" FREQUENCY.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


AT YOUR COMMAND.
*NOTE THAT THE ORDER OF THE MESSAGES CORRESPONDS TO THE SUMMARIZED
```

```
*LIST ABOVE.  MESSAGE 2 WILL NEVER BE GIVEN AFTER AN OUTPUT BECAUSE
*SUCH DATES ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES.  IN THIS
*PARTICULAR EXAMPLE, ALL OTHER MESSAGES BUT 11 WERE NECESSARY.
*
*THE TERMINAL OUTPUT RECEIVED AFTER THE "STOP ↑" COMMAND IS PRODUCED
*BY THE BKY SYSTEM.
STOP
ENTER "STOP ↑" IF YOU WANT TO COMPLETE STOP THIS SESSION
STOP↑
 (JOB STATISTICS)
JOB ENDED - DISCONNECTED
```

INTERAC is a SEEDIS module developed at LBL to provide interactive access to huge databases. It satisfies the major interactive requirements of speed and reliablility. It also allows easy elimination of portions of data from a constantly growing database, and provides detailed statistics on user retrieval patterns, which aids in the structuring of such hude databases. The details are available in reference xyz.

8.1 OVERVIEW

The Berkeley Database Management System (BDMS) is designed to eliminate many of the traditional concerns programmers are faced with when organizing a database. It allows programmers to easily alter applications of the database as well as to devote more energy to applications in the first place.

8.2 ESTICS DATA STRUCTURE USING BDMS

BDMS allows programmers to specify data structure on a logical or "picture" level without knowledge about how the data will actually be structured within the computer system.

In BDMS parlance a **"database"** is structured into units called "records" which pass between BDMS (memory) and storage (disk). These records in turn contain units called "data elements" which are the smallest units with any meaning to BDMS. Physically, a BDMS database is divided into two parts. Part one contains a data structure definition record plus actual data records. Part two contains information which BDMS uses to "access" (store to and retrieve from) part one.

Because BDMS operation requires an entire "database" to be resident on disk, the LBL-ESTICS database has been portioned into logical "subblocks," each of which is small enough to be resident on disk. These subblocks correspond to all the cells produced for a particular month for a particular area. The LBL-ESTICS database, then, is actually divided into many "BDMS databases," and only those referenced by a user are made resident on disk (via the INTERAC system, as explained elsewhere).

In addition, two more "BDMS databases" are required by ESTICS at LBL. One describes each cell ever existant in the ESTICS (via one record for each unique cell label), even if it is not presently produced by any areas. This BDMS database (called the **"cell dictionary"** is used to offer general information about the contents of the ESTICS database as opposed to specific information about the contents of a particular subblock of the database. For example, users may wish to know if particular cells of interest are represented in the ESTICS, even if they were not produced for

say Wyoming local office 1234 in May, 1977. The final "BDMS database" is called the "data element description," and like the "cell dictionary" there is only one. Its function is to offer textual descriptions of coded elements in the other 2 types of "BDMS databases" defined for ESTICS. This prevents the descriptors, which can be quite long in some cases, from being "carried along" in every BDMS database. This in turn implies 1) less data entry error and 2) more efficient use of storage for the TIC's. On the negative side it implies more execution time overhead for applications programs because of increased logic complexity. However, it is not clear how much the savings in storage space will decrease other overhead, thus lessening (or eliminating) this negative aspect.

In summary, the LBL-ESTICS database will be made up of 3 types of "BDMS databases," one of which will exist multiply for every "subblock" (cells produced for one area and month). The structure of the 3 types of BDMS databases is described below.

DATABASE TYPE 1 - AREA/MONTH SUBBLOCKS

DATA ELEMENT NUMBER	.NAME	.TYPE	.FORMAT-RANGE (SEE BELOW)	.KEYED?
1	.THE VALUE	.INTEGER	.ZERO OR ABOVE	.
2	.AREA TYPE	.INTEGER	.1 THROUGH N	.
3	.AREA CODE	.INTEGER	.MORE THAN ZERO	.
4	.DATE	.INTEGER	.MMYY	.
5	.FREQUENCY	.INTEGER	.1 THROUGH N	.
6	.TIME PERIOD	.INTEGER	.1 THROUGH N	.
7	.BREAKOUT	.INTEGER	.1 THROUGH N	.YES
8	.FEDERALLY REQRD	.STRING	.YES OR NO	.
9	.LABEL(S)	.STRING	.UP TO 11 CHARS.	.YES

FORMAT-RANGE EXPLAINATION OF THE DATA ELEMENTS

ELEMENT 1 (THE VALUE) - THE ACTUAL NUMERICAL VALUE OF A CELL AS IDENTIFIED BY THE REST OF THE ELEMENTS.

ELEMENT 2 (AREA TYPE) -
1 = NATIONAL TOTAL
2 = FEDERAL REGION TOTA
3 = STATEWIDE
4 = SMSA
5 = SMSA (STATE PORTION)
6 = SMSA (REGIONAL PORTION)
7 = COUNTY OF RESIDENCE
8 = ADMINISTRATIVE DISTRICT
9 = LOCAL OFFICE
10= AREA OF STATE
11= WIN PROJECT
(OTHERS MAY BE ADDED IN FUTURE)

ELEMENT 3 (AREA CODE) -
-EMPTY (BLANK) FOR NATIONAL TOTAL,
-1 THROUGH 10 FOR THE FEDERAL REGIONS,
-FIPS CODES FOR STATEWIDE,
-STANDARD 4 DIGIT SMSA CODE PLUS 2 ADDITIONAL DIGITS FOR REGIONAL/STATE PORTIONS,
(E.G.,1640 = CINCINNATI, AREA TYPE 4)
(E.G.,164018 = INDIANA PORTION OF CINCINNATI, AREA TYPE 5)
(E.G.,164005 = REGION 5 PORTION OF CINCINNATI, AREA TYPE 6),
-APPROPRIATE 4 DIGIT CODES FOR AREA TYPES 7 THROUGH 11.

ELEMENT 4 (DATE) - THE MONTH AND YEAR OF THE CELL,
"MM" = MONTH, "YY" = YEAR
(E.G., 0677 = JUNE, 1977).

ELEMENT 5 (FREQUENCY) - INDICATES THE FREQUENCY A CELL IS PRODUCED.
1 = MONTHLY
2 = MIDMONTH OF QUARTER
3 = END OF QUARTER
4 = SEMIANNUALLY
(OTHERS MAY BE ADDED IN THE FUTURE)

ELEMENT 6 (TIME PERIOD) - INDICATES THE TIME PERIOD COVERED BY THE CELL.
1 = MONTH
2 = MIDDLE MONTH OF QUARTER (AS OF END OF)
3 = QUARTER
4 = SELECTED TIME PERIOD - 1ST 7 DAYS
5 = SELECTED TIME PERIOD - 1ST MONTH
6 = SELECTED TIME PERIOD - END OF QUARTER
7 = FISCAL YEAR TO DATE
8 = CUMULATIVE, APRIL 1 THROUGH SEPT 30
(OTHERS MAY BE ADDED IN THE FUTURE)

ELEMENT 7 (BREAKOUT) - A CELL MAY BE BROKEN DOWN BY VARIOUS FUNDAMENTAL CHARACTERISESTICS.
1 = ALL APPLICANTS
2 = ECONOMICALLY DISADVANTAGED
3 = MINORITY
4 = VETERAN
5 = U.I. CLAIMANT
6 = WIN
7 = FOOD STAMP
8 = MANDATORY LISTING
9 = E.S. GRANTS
10= ALL JOB OPENINGS OR ORDERS
(OTHERS MAY BE ADDED IN THE FUTURE)

ELEMENT 8 (FEDERALLY REQUIRED?) - A CELL MAY BE SPECIFIED AS A FEDERAL REQUIREMENT TO BE PRODUCED AND SENT TO THE NATIONAL OFFICE ON MAGNETIC TAPE.

ELEMENT 9 (LABELS) - ACTUAL TEXTUAL LABEL(S) IDENTIFYING THE CELL, "LBLCODE," WHERE
"LL" = CA, CJ, CE, AI, AT, OA, OR OJ
"CODE" = NUMERALS.CORRESPONDING TO CHARACTISTIC (CA, CJ OR CE), ACTIVITY (AI OR AT) OR OCCUPATION (OA OR OJ) LABELS
(THIS ELEMENT MAY OCCUR MULTIPLY).

DATABASE TYPE 2 - CELL DICTIONARY

DATA ELEMENT NUMBER	.NAME/PARENT #	.TYPE	.FORMAT-RANGE (SEE BELOW)	.KEYED?
1	.MASTER DATE(S)	.INTEGER	.MMYYMMYY	.
2	.COMMON DATE(S)	.INTEGER	.MMYYMMYY	.
3	.AREA TYPE(S)	.INTEGER	.1 THROUGH N	.
4	.UNCOMMON DATE(S)/#3	.INTEGER	.MMYYMMYY	.
5	.FREQUENCY(IES)	.INTEGER	.1 THROUGH N	.
6	.UNCOMMON DATE(S)/#5	.INTEGER	.MMYYMMYY	.
7	.TIME PERIOD(S)	.INTEGER	.1 THROUGH N	.
8	.UNCOMMON DATE(S)/#7	.INTEGER	.MMYYMMYY	.
9	.BREAKOUT(S)	.INTEGER	.1 THROUGH N	.
10	.UNCOMMON DATE(S)/#9	.INTEGER	.MMYYMMYY	.
11	.FEDERALLY REQUIRED	.STRING	.YES OR NO	.
12	.UNCOMMON DATE(S)/#11	.INTEGER	.MMYYMMYY	.
13	.LABEL(S)	.STRING	.UP TO 11 CHARS	.YES

FORMAT-RANGE EXPLAINATION OF THE DATA ELEMENTS

THE DATA ELEMENTS "AREA TYPE(S)," "FREQUENCY(IES)," "TIME PERIOD(S)," "FEDERALLY REQUIRED," "BREAKOUT(S)" AND "LABEL(S)" ARE DEFINED THE SAME AS FOR THE LBL-ESTICS SUBBLOCKS. WHEREAS THE SUBBLOCK RECORDS ARE STRUCTURED TO IDENTIFY THE INDIVIDUAL CELLS PRODUCED BY A PARTICULAR AREA FOR A PARTICULAR MONTH AND YEAR, THE CELL DICTIONARY RECORDS ARE STRUCTURED TO IDENTIFY EVERY CELL WHICH HAS EVER BEEN PRODUCED BY ANY AREA FOR ANY MONTH AND YEAR. IT IS EXPECTED THAT MOST UNIQUELY LABELED CELLS WILL BE PRODUCED FOR THE SAME "COMMON" DATES REQUARDLESS OF WHICH AREA TYPES PRODUCED THEM FOR WHATEVER FREQUENCIES, TIME PERIODS, BREAKOUTS AND FEDERAL REQUIREMENT. HOWEVER, THERE IS NO THEORETICAL REASON WHY THIS MUST BE TRUE. IN ORDER TO ADDRESS THIS SITUATION EFFICIENTLY, "UNCOMMON DATE(S)" MAY BE ENTERED INTO THE DATABASE ONLY IF THEY DO NOT CORRESPOND TO COMMON DATES. FOR EXAMPLE, SUPPOSE THE CELL LABELED "TOTAL PLACEMENTS (AI005) OF PEOPLE UNDER 20 (CA005) IN NONAGRICULTURAL INDUSTRIES (CJ005), COUNTING INDIVIDUALS" WAS PRODUCED AS A FEDERAL REQUIREMENT FROM JUNE, 1975, TO DECEMBER, 1975, AND FROM JUNE, 1976 TO PRESENT FOR NATIONAL, REGIONAL AND STATEWIDE AREAS FOR THE SAME FREQUENCY, TIME PERIOD AND

BREAKOUTS. THE RECORD FOR SUCH A CELL WOULD CONTAIN 2 ENTRIES FOR DATA ELEMENT #2, INDICATING THE "COMMON DATES" OF 06751275 (JUNE THROUGH DECEMBER OF 1975) AND 0676 (JUNE, 1976, TO PRESENT). THERE WOULD BE 3 ENTRIES OF DATA ELEMENT #3, INDICATING THE CELL WAS PRODUCED FOR AREA TYPES 1 (NATIONAL TOTALS), 2 (REGIONAL TOTALS) AND 3 (STATEWIDE TOTALS) FOR THE COMMON DATES INDICATED BY DATA ELEMENT #2. THERE WOULD BE NO ENTRIES FOR DATA ELEMENT #4. NOW SUPPOSE THAT WHEN THE CELL WAS PRODUCED BEGINNING JUNE, 1976, IT WAS ALSO PRODUCED FOR SMSA'S. THERE WOULD THEN BE A 4TH ENTRY FOR DATA ELEMENT #3 INDICATING AREA TYPE 4 (SMSA'S). BUT SINCE THE COMMON DATES DO NOT APPLY TO SMSA'S (THEY WERE NOT PRODUCED FROM JUNE THROUGH DECEMBER, 1975), THERE WOULD THEN BE A DATA ELEMENT #4, NAMELY 0676, ASSOCIATED WITH THE 4TH ENTRY OF DATA ELEMENT #3, INDICATING THAT THE CELL WAS ONLY PRODUCED FOR SMSA'S BEGINNING JUNE, 1976. NOTE THAT ALL THE DATA ELEMENTS IN THE "CELL DICTIONARY" RECORDS MY OCCUR MULTIPLY. ALSO NOTE THAT FOR ANY DATE, THE SAME FREQUENCY(IES), TIME PERIOD(S), AND BREAKOUT(S) APPLY TO ALL AREA TYPES PRODUCED DURING THAT DATE; ONLY THE FEDERAL REQUIREMENT MAY VARY. FINALLY, NOTE THAT UNCOMMON DATES ARE NOT NECESSARILY SUBSETS OF THE COMMON DATES, AND INDEED, NO COMMON DATES NEED EXIST AT ALL! (THIS WOULD HAPPEN IF A CELL WERE PRODUCED FOR A COMPLETELY DIFFERENT AREA TYPE, FREQUENCY, TIME PERIOD, BREAKOUT AND FEDERAL REQUIREMENT.) THE "MASTER DATE(S)" ELEMENT IS THE UNION OF ALL COMMON AND UNCOMMON DATES FOR WHICH THE CELL HAS EVER BEEN PRODUCED.

DATABASE TYPE 3 - DATA ELEMENT DESCRIPTORS

DATA ELEMENT NUMBER	.NAME	.TYPE	.FORMAT-RANGE (SEE BELOW)	.KEYED?
1	.DATA ELEMENT NAME	.STRING	.UP TO ? CHARS	.YES
2	.DATA ELEMENT CODE	.INTEGER	.UP TO 9 DIGITS	.YES
3	.DATA ELEMENT TEXT	.STRING	.UP TO ? CHARS	.

FORMAT-RANGE EXPLAINATION OF THE DATA ELEMENTS

ELEMENT 1 (DATA ELEMENT NAME) - THE POSSIBILITIES ARE
"AREA TYPE,"
"FREQUENCY,"
"TIME PERIOD,"
"BREAKOUT,"
"CA" FOR CHARACTERISTICS OF APPLICANTS CELL LABELS,
"CJ" FOR CHARACTERISTICS OF JOB ORDERS CELL LABELS,
"CE" FOR CHARACTERISTICS OF EMPLOYERS CELL LABELS,
"AI" FOR ACTIVITY CELL LABELS, COUNTING INDIVIDUALS,
"AT" FOR ACTIVITY CELL LABELS, COUNTING TRANSACTIONS,
"OA" FOR OCCUPATION OF APPLICANTS CELL LABELS,
"OJ" FOR OCCUPATION OF JOB ORDERS CELL LABELS AND
(OTHERS MAY BE ADDED IN THE FUTURE)

ELEMENT 2 (DATA ELEMENT CODE) - THESE ARE EXPLAINED UNDER THE "LBL-ESTICS SUBBLOCKS" DATA STRUCTURE. FOR EXAMPLE, FOR "AREA TYPE" IT MIGHT BE "9" INDICATING "LOCAL OFFICE." FOR "OJ" IT MIGHT BE "912384010" INDICATING "AIRPORT SERVICEMAN."

ELEMENT 3 (DATA ELEMENT TEXT) - THE ACTUAL TEXT CORRESPONDING TO THE DATA ELEMENT NAME AND CODE GIVEN IN DATA ELEMENTS #1 AND #2 RESPECTIVELY. FOR EXAMPLE, FOR DATA ELEMENT NAME "AREA TYPE," CODE "3" IT WOULD BE "STATEWIDE" AND FOR DATA ELEMENT NAME "CJ," CODE "005" IT WOULD BE "NONAGRICULTURAL INDUSTRIES."

NOTE THAT THE SOLE REASON FOR THE EXISTANCE OF THIS "BDMS DATABASE" IS TO PROVIDE THE TEXTUAL IDENTIFIERS FOR CODES SO THAT SUCH TEXT NEED NOT BE PRESENT IN THE OTHER 2 BDMS DATABASES. THIS IS IMPORTANT BECAUSE IT WILL SAVE SPACE IN THE OTHER 2 BDMS DATABASES, ONE OF WHICH WILL OCCUR MANY

TIMES (THE LBL-ESTIC SUBBLOCKS) AND ONE OF WHICH WILL BE VERY LARGE EVEN WITHOUT THE PRESENCE OF SUCH TEXT (THE CELL DICTIONARY).

(NOT YET WRITTEN.)

(NOT YET WRITTEN.)

The following excerpt is from the formal RMIS contract modification.

2. Scope of the Modification

LBL will undertake to the extent of available resources the following activities -

a. Review the data collection procedure and identify data items available in the ESARS source files. This will be done by studying documentation describing the current reporting system, consulting with the staff of the Office of Management Information Systems (OMIS), Manpower Administration (MA) and possible site visits to State Employment Security Agencies (SESAs) in MA Region IX.

B. Determine the data elements and geographical detail that should be contained in the data base. Data base as used herein is meant to be summary data which is aggregated from the detail records in the ESARS files maintained in each SESA. The files to be considered are - Applicant Characteristics File; Job Order File; and Service (Transaction) File. OMIS-MA will have the major responsibility for specifying these elements and the geographical levels.

C. Design a data structure for this data which will permit easy access to specific elements and/or general categories of data elements. The structure should provide optimum facility for the user to access or retrieve any element or category of data. The indexing scheme should be flexible enough to allow for additions to or changes of data definitions with minimum difficulty or to the addition, deletion or change of a data field. Prepare a user index scheme that will enable users to readily identify data relating to specific subjects.

D. General design of the computer programming logic to aggregate source files to an ESARS summary data base, including summaries at geographical levels within a State.

E. Investigate the possibility of installing or using this data base on commercially available data management systems or on systems under development at LBL. If commercially developed software is determined feasible and recommended it must be machine independent so as not to require any vendor's proprietary software, devices or unique programming languages. Any system or software so recommended should be available for use throughout the State Employment Security System.

F. Implement prototype access and retrieval mechanisms for experimenting with and testing the design. The prototype system will be based on work currently being done on the ESARS Summary Reports data.

G. General specification of the type of computing equipment which will be required for implementation at state level, regional and national level (including access and retrieval capabilities). Alternative devices may be considered so long as they can be interchanged with a minimum of system modification. For example, use of random type storage devices in lieu of sequential devices.

1 ACRONYMS

46 BDMS DATABASE
10 BDMS
14 BERKELEY DATABASE MANAGEMNT SYSTEM (BDMS
1 BOLDFACED TYPE

46 CELL DICTIONARY

47 DATA ELEMENT DESCRIPTION
14 DATABASE MANAGEMENT SYSTEM (DBMS)
2 DOL-ETA

2 ESARS

1 INDEX
10 INTERAC

2 RMIS

2 SEEDIS

10 TIC

10, 18 UOI

LEGAL NOTICE —

This report was prepared under a contract with the Employment and Training Administration, U.S. Department of Labor. Researchers undertaking such projects under Government sponsorship are encouraged to express their own judgment. Interpretations or viewpoints stated in this document do not necessarily represent the official position of policy of the Department of Labor

This report was done with support from the United States Energy Research and Development Administration. Any conclusions or opinions expressed in this report represent solely those of the author(s) and not necessarily those of The Regents of the University of California, the Lawrence Berkeley Laboratory or the United States Energy Research and Development Administration.